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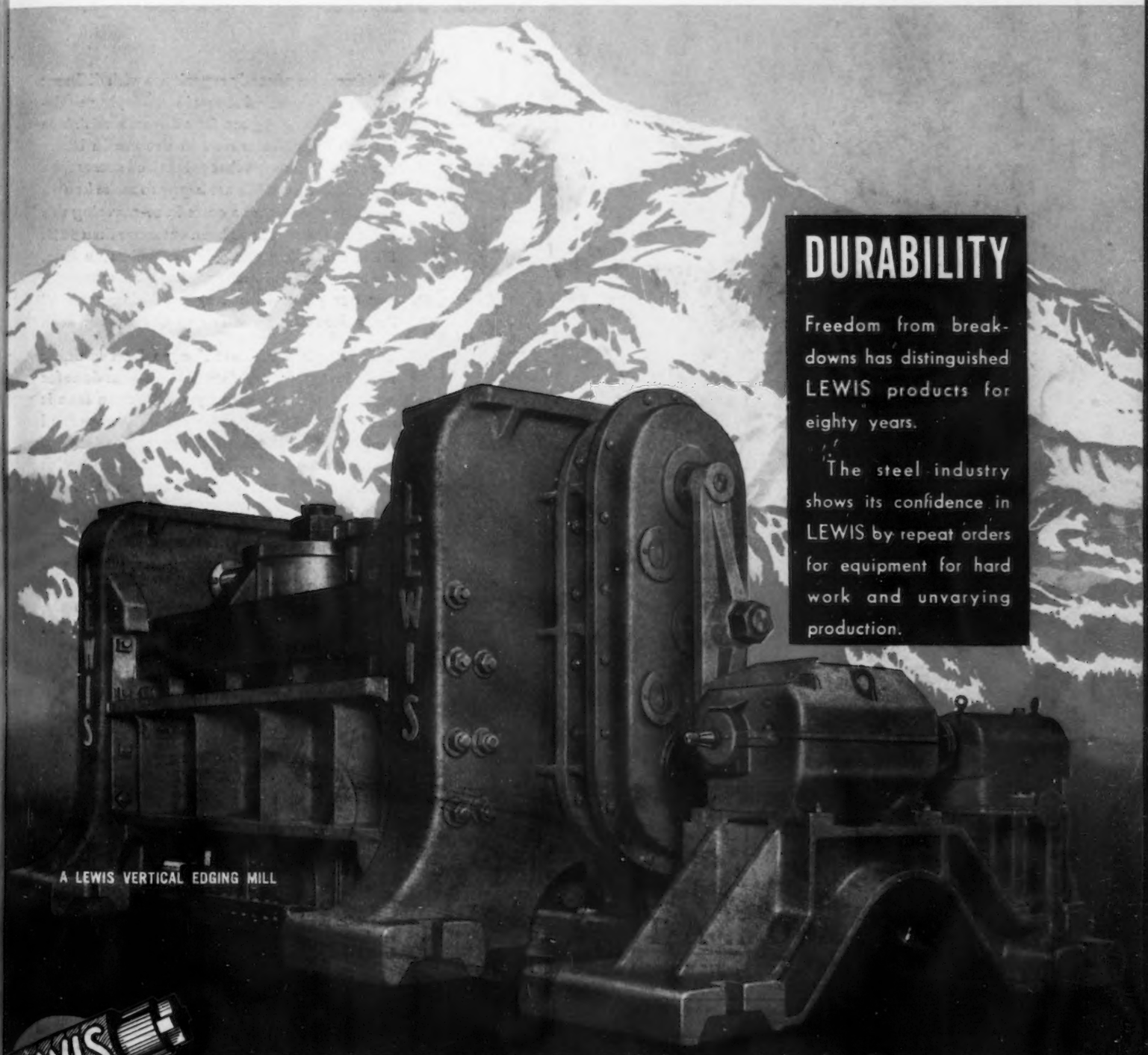
# THE IRON AGE

OCTOBER 1, 1936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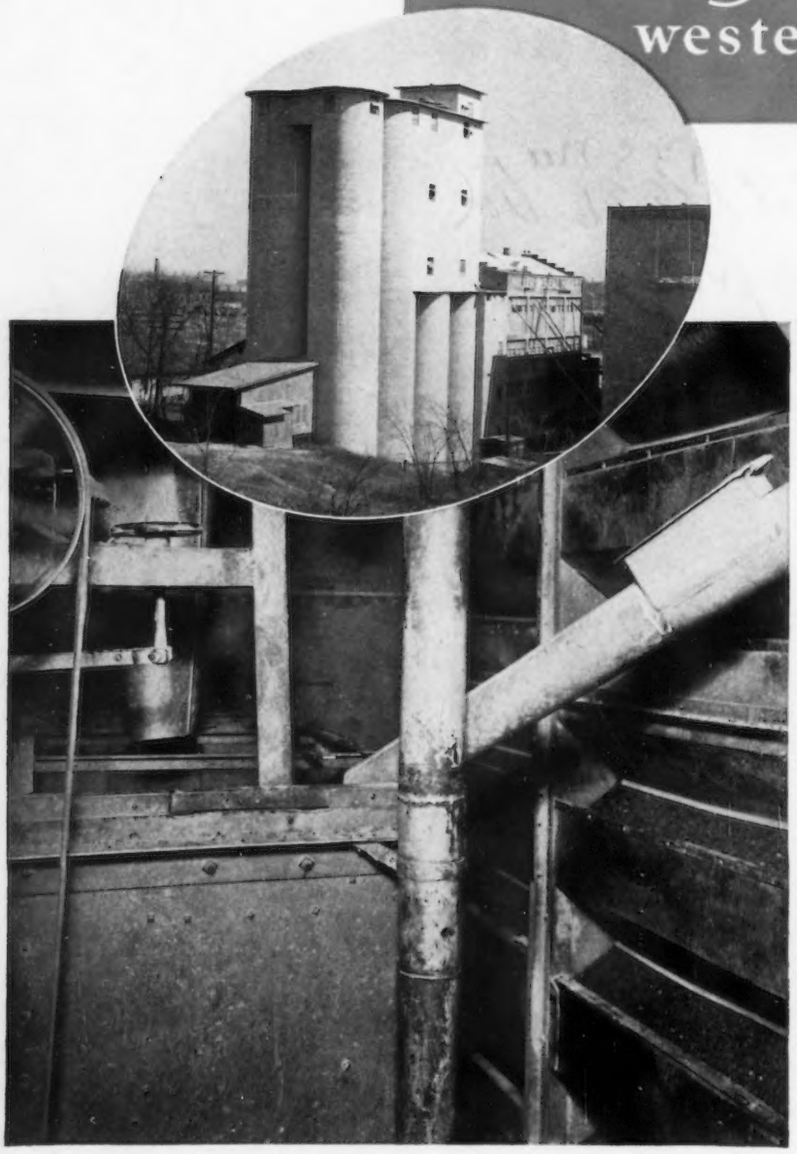

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# THE IRON AGE

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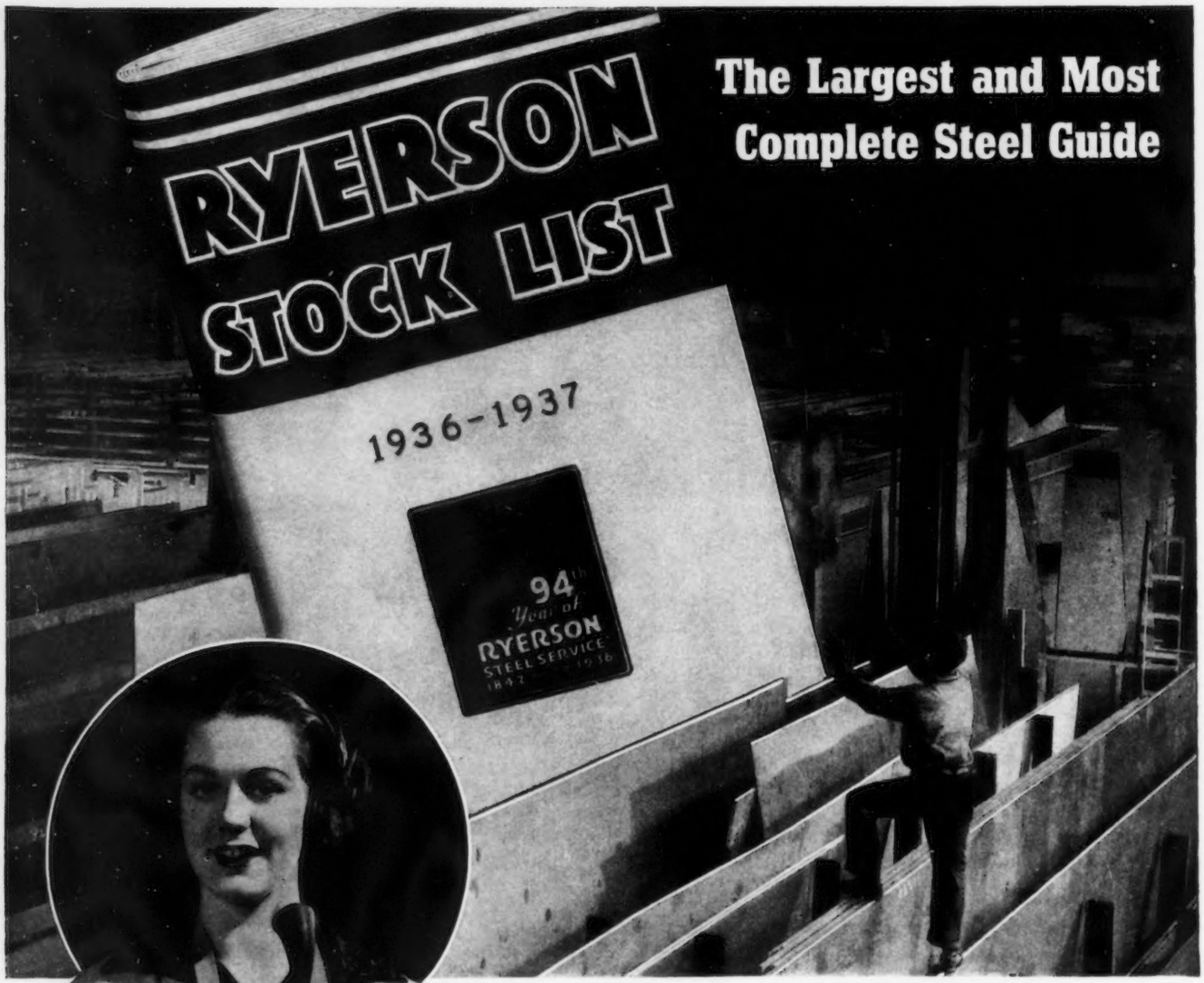


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OCTOBER 1, 1936

ESTABLISHED 1855 Vol. 138, No. 14

# British Steel Recovery Greater Than Ours

SELDOM has the steel industry been a more interesting or useful barometer of industrial recovery than at present. Its progress is being watched by business men, economists and investors and—in view of the approaching Presidential election—with equally close attention by politicians.

A moot question in business and political circles is, when did recovery start and to what extent is it due to governmental pump priming.

Using steel as a barometer, the low point of the depression occurred in August, 1932. But it has taken the steel industry almost four years to reach continuously profitable operation. While 1935 bore a semblance of return to prosperous conditions, the total output of steel in that year was the lowest since the depression year 1921, barring the 1931-34 period.

It is interesting to compare the recovery of our own steel industry with that of Great Britain, which has pursued more orthodox means of regaining economic stability.

The low point of British steel production occurred in August, 1931. British steel production in 1931 dropped only 46 per cent from its 1929 total, whereas American steel output at its low in 1932 declined more than 75 per cent from 1929. By 1933 British steel production had attained about 73 per cent of its 1929 total, whereas in the United States steel output in 1933 was less than 42 per cent of the 1929 total.

Furthermore, recovery in steel in Great Britain has been proceeding more rapidly than in the United States. In the first eight months Great Britain turned out 78 per cent of its total for the full year 1929, while the United States total for eight months this year is only 53.1 per cent of 1929.

Even if the comparison with 1929 be rejected as abnormal and an average of normal years be used as a base, the results point to the same conclusion—that British industrial recovery under orthodox methods has proceeded much farther than our own. If the period 1925 to 1927, inclusive (three "average" years), be taken, it is shown that United States steel output for the first eight months of this year was only 64½ per cent of that average, while British output in the same period was 113 per cent of that same period.

Under these circumstances it can hardly be argued fairly that the degree of recovery we have attained is the pet property of this Administration. Great Britain has done much better in its come-back without a New Deal to strangle individual initiative.

C. E. WRIGHT

*Managing Editor,*
*The Iron Age*

# Stainless Steel Broadens Its Market....

By CURTIS C. SNYDER

*Sales Engineer, Republic Steel Corp., Alloy Steel Division, Massillon, Ohio*

STAINLESS STEEL torch holders were used by the speedy torch carriers who began their triumphal relay in Greece on July 20 and whose arrival in Berlin Aug. 1 signalized the opening of the Olympic games. But even the rapid strides of the Olympic athletes are no match for the speed with which stainless steel is progressing,—every day breaking records for production and for diversification of uses. The first Olympic Games were held in ancient times—today they are still of world-wide interest. The first stainless steel was made but a few years back; even so, handicapped as it is by its youthfulness, it will shine in years to come with as much brilliance as the future Olympic stars.

Much has already been written of the origin of stainless, how during the period of 1910-1914 two investigators of different nationalities, Brearley of England and Strauss of Germany, were credited with the discovery of our two fundamental types—the straight chromium and the chrome-nickel grades respectively. Brearley's work, which resulted in his gaining a patent covering stainless cutlery steels, was intended primarily to develop a metal resistant to fouling and erosion in gun barrels. Strauss was conducting experiments to find a metal suitable for protective tubes for thermo-couples when he observed the great corrosion resistance of 18-8 to fresh water, sea water and the atmosphere.

In this country, Armstrong, Becket, Johnson, Palmer and others have been responsible for patents supplementary to or modifying the originals.

There is some difference of opinion as to when stainless steel was first placed on a production basis. It seems, however, that Thomas Firth & Sons, Ltd., Sheffield, England, can demand the laurels, for in 1914 they produced 50 tons of cutlery steel. The following year the Firth-Sterling plant in this country began the commercial production of the same alloy.

In the early 20's low carbon, straight-chromium steels were being manufactured by American producers and in the middle 20's the first 18-8 alloys were being commercially manufactured here. In 1925-27 there were but two or three major companies melting stainless and the types were limited to the cutlery analysis, straight chromium, and 18-8. During that period 18-8 was melted with a carbon content of 0.10/.25. It was not until several years later that the benefits of low carbon for welding and high-temperature service were realized.

## Produced by Score of Companies

Today stainless steel is being produced and sold by more than a score of companies in forms of polished and unpolished sheets—hot and

DECORATIVE uses for stainless steel keep pace with the more utilitarian developments. In this attractive room the floor is inlaid with stainless steel strips.

cold rolled strip, bars, tubing, angles and all other accessory commodities. From the several grades being melted in 1925, more than 60 are now classified by the American Iron and Steel Institute.

In recent years the elements of molybdenum, titanium, selenium, zirconium, columbium, copper, and others have been added to the stainless steel to impart special properties—to open new and broader fields of application. Three per cent molybdenum in 18-8 greatly increases its corrosion resistance to sulphuric and hydrochloric, acetic and phosphoric acids and is widely used in the wet processing of woolen and cotton textiles, felts, in paper and pulp equipment, and for many chemical processes. Zirconium and selenium, and small amounts of molybdenum and sulphur produce properties in stainless which makes it readily machinable. Less than 1 per cent of titanium or columbium in 18-8 is helpful in reducing carbide precipitation during welding or in high-temperature operations.

Nickel in percentages of 1 to 2 per cent increases the hardening power of the straight chromium grades and imparts greater toughness as does also ½ per cent molybdenum. The creep strength at elevated temperatures is materially increased by the alloying of molybdenum and tungsten, this applying to the chrome-nickel grades as well.

So it is a far cry from the 50 tons of stainless cutlery steel produced in England in 1914 to the thousands and thousands of tons of many different grades of stainless manufactured in 1935 in the United States.

## Tonnage Has Grown Rapidly

Accurate figures of stainless steel tonnage are not available except for the past several years. Needless to say, the increase has been steady except for a slight dip during the recent business depression. During this period, while common steel products dropped to an almost hitherto unknown low, stainless steel went quietly about its way, finding new uses, making new friends, helping to put life and color into a then rather drab steel industry.

The big production years for stainless steel were 1929 and 1930. Ford had adopted stainless for radiator and lamp shells, hub caps, moldings and other bright parts. The tonnage being used by Ford was enormous—two mills being kept busy to supply his requirements. The era of stainless steel really began with the advent of its use on this popular priced car.

Other steel manufacturers were becoming cognizant of the possibilities of stainless—one by one they followed the leader. Some dropped by the wayside; others, with fingers slightly burned, took

their medicine, which meant tremendous losses until successful operating practices were evolved. At the present time there is scarcely a steel producer of any size who is not actively engaged with stainless production. In this large family are included many concerns, not necessarily melters of steel, but cold rollers, tube manufacturers and sheet producers.

Tonnage for 1936 will be 60 per cent greater than for 1935. This amazing increase is not necessarily due to better business conditions, rather to the greater number of fields which are being invaded. The high-speed lightweight trains will employ many more tons of stainless steel this year than the entire production of 1926, 25 per cent of that of 1932 say that next year's requirement will be 50 per cent greater than for 1936.

Government agencies are enthusiastic over the fine properties of stainless steel and are specifying it in dam and power plant construction, for marine service, for equipment in veterans' hospitals. Water pitchers of stainless by the thousands have been placed in Army camps. Food and service trays, meat platters and table ware are standard in both Army and Navy; galley and scullery equipment are made of 18-8. As befits their importance, the White House kitchen and pantries are profusely equipped with stainless steel—even the portable food cabinet from which the President is served his daily luncheon in his office is a shining sanitary example of the utility and beauty of stainless steel.

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ONE of the most modern developments is the automobile trailer, which has adopted stainless steel for interior equipment.

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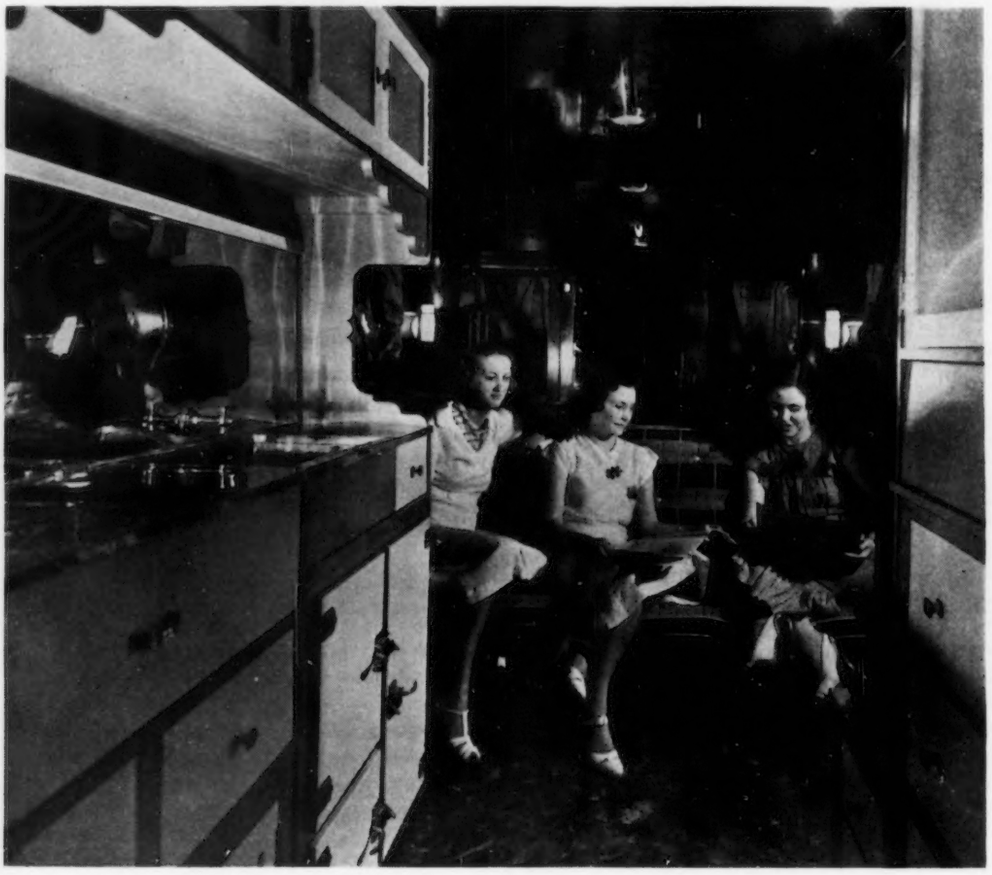


Table I is taken from figures collected by THE IRON AGE in its annual stainless steel survey, dating from 1929 to 1935, and includes all grades of wrought stainless steel. THE IRON AGE survey has been reported in net tons of ingot production and in addition the author has included his estimate of finished steel (sheets, bars, strip, plate, etc.) shipped during this period. The estimates are based on a 40 to 50 per cent yield.

Equipment for the wet processing and dyeing of textiles will require 1000 tons in 1936, compared with a negligible amount used in 1930. In dollars and cents the 1000 tons will be little less than a million dollars—equal to a production of 30,000 tons of common steel. The automotive industry has always been partial to stainless—this year its demands for stainless steel make it the country's largest user. Authoritative sources in Detroit

TABLE I

| | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 | 1935 |
|---|---|---|---|---|---|---|---|
| [1] | 48,890 | 54,949 | 30,680 | 23,832 | 36,252 | 43,695 | 67,227 |
| [2] | 19,556 | 22,000 | 12,272 | 10,710 | 16,312 | 19,662 | 33,185 |

[1] Net tons ingot production. [2] Net tons of finished steel (1929-1935).

## Used in Flood Control Work

The Government is spending millions of dollars annually on the Mississippi River revetment program in an endeavor to control

this mighty body of water. So that the results of this work will be permanent, stainless steel has been advocated as reenforcement for the concrete mattresses and for fasteners to tie the mats together. Very shortly a large experimental installation of 5000 mats embodying high tensile strength stainless steel will be placed in the river. The stainless steel will replace copper clad wire. Even though the initial cost of the stainless steel mats may be slightly higher, the ultimate cost, over a period of years, will be considerably less.

### High Tensile Strength Attained

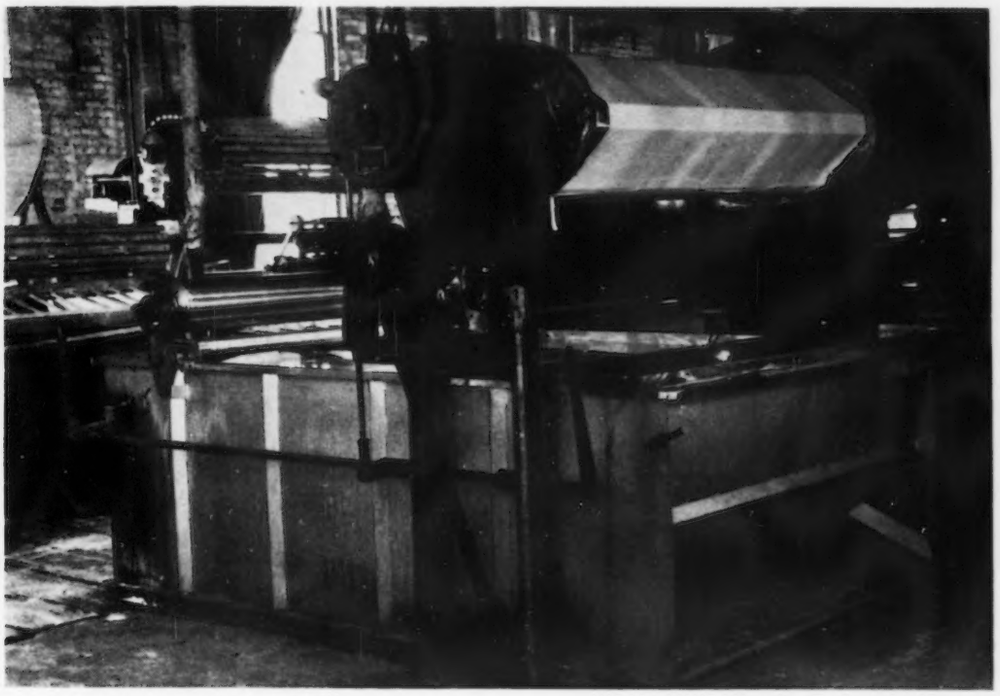
Consider for a moment the stainless steel high-speed trains. The birth of the Budd trains is not only revolutionizing transportation, it has been responsible for the development of new methods of metal processing. 18-8 in the annealed condition has a tensile strength around 90,000 lb. per sq. in.; this can be increased by cold working to as high as 300,000 lb. For rail car work, material with a minimum of 150,000 lb. is generally applied and with this high temper it can be readily fabricated, rolled, molded and bent in brakes. Welding offered somewhat of a problem. The usual methods of arc, gas, and spot welding would destroy the strength of the metal and decrease its corrosion resistance adjacent to the weld, provided high-carbon material was used, which is essential for obtaining the hard temper. To circumvent this problem, Budd engineering genius developed the "shot welding" process, a time controlled spot weld. This weld is made so quickly—an infinitesimal fraction of a second—that there is not enough heat generated to cause any loss of strength. Of equal importance, there is no formation of chromium carbide at the weld, which might decrease the corrosion resistance. Once again, American initiative has not been found wanting.

### New Use Is Insect Screens

Stainless steel has been used for many purposes in the home—kitchen sinks, cooking utensils, table ware, table tops—but a recent development may surpass all others as far as tonnage is concerned. Its use for insect screens—ordinary window screening—does not conjure thoughts of remarkable tonnage, but this application has all of the aspects of a sizable market. All of us at frequent intervals are confronted with the necessity of replacing and repainting rusted and corroded screens. This is especially true in industrial centers and along the seashore where salt air and salt water exact their annual toll.

In some localities non-ferrous metals have been used with some degree of success, in others the active corrosive agents in the atmosphere are too powerful and cause rapid failure. In some instances it is not the failure of the screen that is the chief trouble-maker but rather the corrosive products resulting therefrom, causing staining of paint on the window sills and streaking the sides of white or light colored homes. These are even more disagreeable than failure of the screen wire.

Tests along the seashore, in bad inland atmospheres, in the tropics where corrosion is at its worst because of high humidity, stainless steel of the 3 per cent molybdenum type has been entirely unaffected. No staining, no corrosion, even after long periods of exposure. Other commercial screen metals tested simultaneously failed completely, or revealed definite indications of early failure. 18-8-SMo insect screen is available commercially—the cost but sligthly higher than present screening.



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DYEING machines of stainless steel have solved one of the most vexing problems of the textile manufacturer—the obtaining of true colors.

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### Use Growing for Dye Vats

Who would believe that stainless steel is to a great extent responsible for the attractiveness of milady's frocks? No, not the tailoring, but the colors—vivid, bright hues, as well as the soft seasonal shades. Cottons, silks, rayons and

woolens dyed in stainless steel lined vats are true colors. No off shades or dulling of lustre due to a color effect from the tank lining, for stainless steel is immune to the action of even the strongest acid dyes—dyes containing sulphuric, acetic and formic acid. Neither alkaline solutions in certain processes nor bleaching solutions, whether of the chlorine or hydrogen peroxide type, do harm to stainless steel.

Because of the multiplicity of colors, the necessity for frequent changes of dye solutions is apparent. When changing from one color to another it is only necessary to flush the stainless steel vat with warm water to remove all traces of dye. The tank can be in use again in 15 minutes with a new color. Compare this with the several hours required to boil out the color in a wooden tank and no assurance that the dye has been entirely removed. One stainless steel vat will take the place of five ordinary tanks, whether of wood or non-ferrous metal. In so doing it produces the true color—economical, no rejects, no re-runs—on a routine production basis.

One of medical science's greatest contributions in recent years has been insulin, for the treatment of diabetes. There have been many problems in connection with the production of insulin—a major one to find suitable materials for equipment used in its processing. The versatility of stainless steel was again called upon. Extensive tests indicated that one type of stainless had merit—a pilot installation verified the preliminary findings—and this has resulted in a large production installation.

## Hospital Animal Cages of Stainless

Hospitals have their laboratories, too. Before subjecting human beings to a new medical treatment, the reaction of small animals is first obtained. For housing these animals, stainless steel cages have been recently specified on a large New York City project, and will require 20 tons of 18-8.

Perhaps no application of stainless steel is more spectacular than when used for architectural purposes. A casual stroll along the Atlantic City boardwalk, through New York City's busy avenues, down any city's main street, draws this vividly to one's attention. In an effort to dress up, to attract attention with resultant patronage, stainless steel is being applied lavishly. The stainless store front stands out from its neighbors. Whether it be a combination of stainless and colored enameled steel sheets, or stainless used alone for its individuality, it gains the same result. Many manufacturers are producing stainless steel store fronts and window molding sections. A development of several years past is the overlaying of thin stainless steel strips on a cheaper non-corrosive metal to produce a section, polished to a beautiful lustre, and having maximum corrosive resistance, at a cost no higher than for competitive non-ferrous metals.

Indicative of the trend toward stainless steel for store front modernization are the figures in Table II, taken from a compilation made by the building industry.

**TABLE II**

| Type of Material | 1933 | 1935 |
|---|---|---|
| Stainless steel | 14.5% | 55.0% |
| Metal A | 62.0% | 37.0% |
| Metal B | 12.0% | 6.0% |
| Metal C | 11.5% | 2.0% |

These figures are even more striking when it is realized that in 1929 stainless steel was almost unknown for this type of work, Metal "C" rating 90 per cent. Conservative estimates place 75 per cent as the figure stainless will reach in 1936.

## Coloring of Stainless Opens a New Field

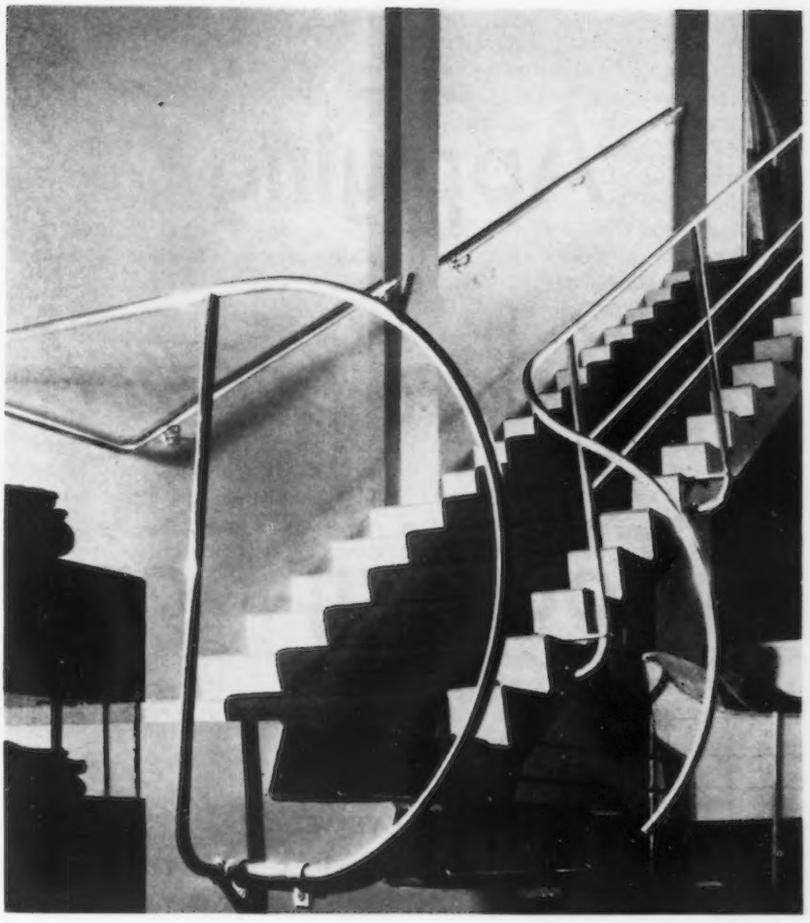
Stainless steel in colors will undoubtedly play an increasingly important part in the future of the industry. Complete details of the process are lacking, but it is reported that tests point to increased corrosion resistance in certain directions—good abrasion properties. The coloring is said to be accomplished best after the part is completely fabricated—can be processed quickly and at small cost. All of the primary colors and combinations are obtainable. Even a vivid imagination can hardly foretell what this new process will mean. A conservative one can easily visualize striking architectural effects, combining both beauty and permanence—attractive articles of flatware and hollow ware for table

WITH the modernization of railroad equipment to meet present-day competitive conditions, the stainless steel railroad kitchen has arrived.

service in the home, restaurant and hotel—colored trim applied to stoves, refrigerators, furniture and tables. These are but a few of the manifold possibilities.

Leading producers, designers and fabricators of stainless steel believe that it is only in its infancy as far as tonnage is concerned, that its production will increase annually as its use becomes more diversified. There are still some business men who contend stainless is an artificially priced commodity—do not feel that its cost is justified. To others stainless has been their commercial salvation, has been responsible for increased business, wider markets, and greater profits.

An example worth reporting is that of a concern manufacturing kitchen utensils. They were forced to undergo reorganization several years ago. Upon resuming operations they started production of a line of stainless steel cooking utensils. Today, their production is exclusively in stainless steel. From 1500 pieces fabricated in their first six months, that figure is now their daily production—their daily bread.



STAINLESS steel tubing effectively used as a stair railing in a haberdashery shop.

# Applying *Technical Control* to Foundry Sand

° ° °

By FRED L. WEAVER
*Metallurgist, Great Lakes Foundry Sand Co.*

° ° °

° ° °

IN the beginning, industry was entirely dependent upon the skill of the workman who, at most, had no more than a vague scientific or systematic knowledge of the materials he was given to work with. The product of his skill or craftsmanship necessarily varied in quality with variations in raw materials, largely because of the same lack of systematic knowledge or its application in producing these raw materials. Even today we have a great number of men who have become quite satisfied with their ability to perform a certain task well and hence are not receptive to suggested methods of improving their handiwork.

The technician, however, is fast replacing the man who depends purely upon his skill and craft in making a production article. By this we do not mean to infer that industry will not require the expertness of specialists in definite operations. It is more than likely, however, that the technician who controls the properties of material will also have much to say in respect to the proper technique in the fabrication of any article.

One industry that has been very delinquent in adopting technical control is the foundry or cast metal industry. One reason for the foundry being the last major industry to adopt more systematic methods is that in a large measure, until very recently, it was anything but a pleasant place in which to be. It held no attraction for the student of technology, who naturally seeks a clean atmosphere in which to work, having been taught that good housekeeping is essential to accurate results in collecting test data. However, the new laws regarding dust elimination are having a profound effect in making the dingy foundry a more healthful place in which to apply the new technology.

Another reason that has held back the use of more scientific methods is the fact that most foundrymen have considered themselves practical men rather than technologists. When they attended meetings in which the speaker used terms or described procedures with which they were not familiar, they immediately became discouraged and felt that the subject was way over their heads, or too technical. A little more interest in what we do not understand would place the average technical subject in a very practical light. To the receptive and ambitious workman, what seems to be too technical today is common knowledge tomorrow.

## Sound Technical Advice is Sought

While the foundry departments of the automotive industry have no

doubt been the leaders in adopting technical control in the ancient art of casting metals, today even the smallest jobbing shops are anxious to get sound technical advice on problems that have been recurring for years, but which have heretofore been uncontrollable and accepted as the grief natural to the art.

A very good example of this new attitude is found in the molding sand problem. We still have molders of the old school and even foundry managers who feel that they must go to the far corners of the earth to get a sand best adapted to their work, only to find that the second carload differs from the first and the third is not comparable with the first two. This experience leads such a man to seek another source of supply, only to be confronted with the same situation year after year. Large production shops, such as the foundry departments of automobile plants, on the other hand, found some years ago that precise control of molding sands could be obtained only through the use of synthetic sands made to standard specifications as to basic grain, correct fineness and grain distribution, as well as the right bonding material to give the best strength, permeability and finish for the class of work at hand. installed in the laboratory, and sand reconditioning machines are now a familiar sight in any of the large production foundries

In the last few years we have begun to see the small but progressive foundry apply the same techniques in order to obtain consistent sand properties and thereby eliminate variations in castings and reduce the percentage of scrap. The investment in a good sand mixer, a beater or aeriator and the minimum of sand testing equipment gives even the smallest foundry technical sand control. Economies of less new sand, less waste, and the use of lower cost material more than offset the small investment in equipment that is called for. In this way the foundryman can obtain a tailor-made sand under production control.

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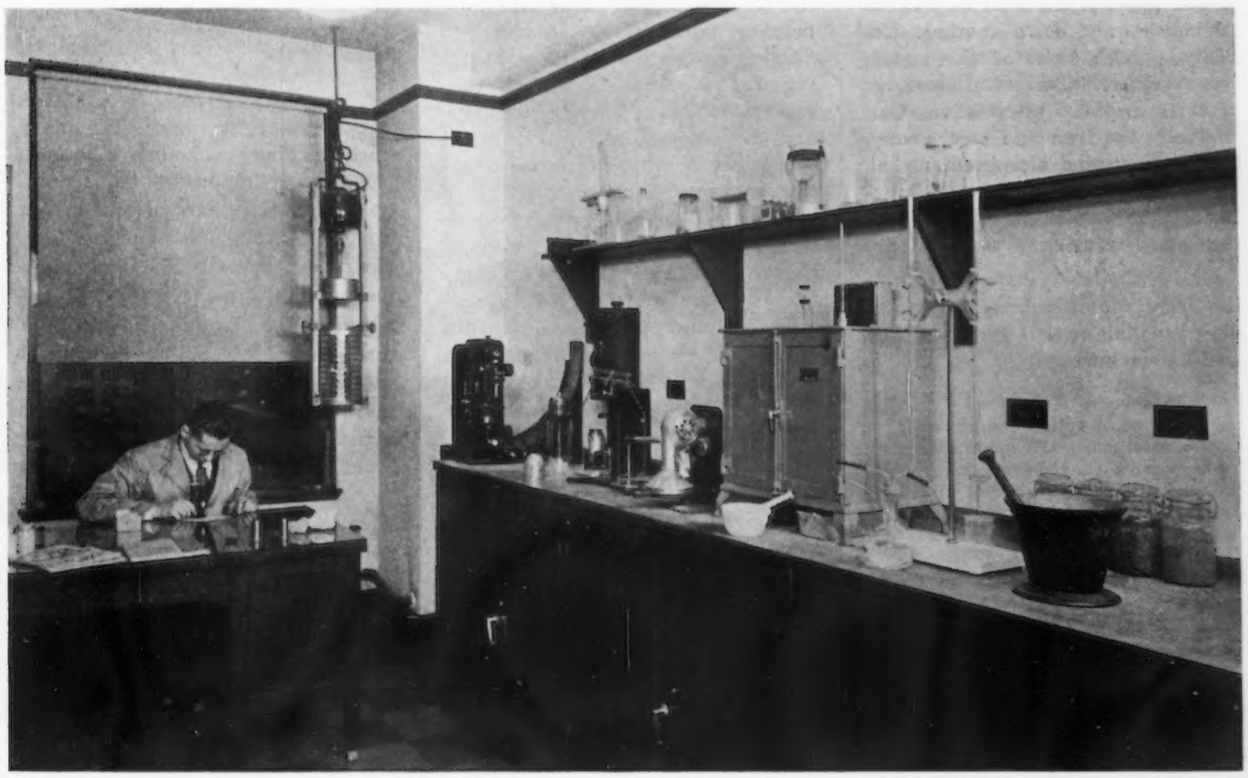
Natural bank sands contain varied amounts of clay which form the binder in molding. Synthetic sands, on the other hand, are derived from cheaper lake core sands, such as the Lake Michigan variety, which are practically free from clay. The necessary clay binder is added in the muller in the foundry to obtain the specification desired. Further economy is found in the recovery and reuse of used core sand, which again is clay free; but obviously an analysis of the grain fineness and shape must be made to suit the finish of the work being cast. In other words, sand control begins by taking basic elements of known characteristics and constructing a molding material best suited for all of the conditions which should be under control, such as the type of casting, its size and weight with respect to the kind and temperature of the metal. Even the refractory characteristics of the sand can be controlled.

This business of synthetic foundry sands which are now becoming so popular is just one example of how practical most technical things really are. As a matter of fact, the gap between practical things and technical things is a myth, except, of course, in the field of pure theory.



A TYPICAL foundry sand control laboratory, showing the screen vibrator for fineness analysis, strength machine, permeability meter, moisture teller and drying apparatus. The author is shown examining some sand grains under the microscope. The labor required for this scientific control of sand need not exceed one hour for every ten tons of metal melted.

# The Bloody "Battle of

THE battle of metals and materials! Some people imagine it to be a cut-throat affair in which no quarter is asked or given. Steel, Copper, Aluminum, Zinc, Plastics marshalling their forces toward the objective of substitution. The battle for the conquest of the market.

That may be a dramatic and picturesque conception but it is far from being the truth. No material maker can afford to be satisfied with substitution or with depriving another material maker of a rightly earned share of the business. The real competition of metals and materials is the common endeavor to enlarge all markets through providing materials for man's purposes which will accomplish that which cannot be achieved with what we now have.

I see by the papers that the good old "Battle of the Metals" is on again!

If memory serves me, this is about the fourth return engagement of this stirring industrial war drama to be fought out in the trade and popular press in as many decades. Every so often this "Battle of the Metals" breaks out afresh and rages up one column of our periodicals and down another. Yet oddly enough, none of the metals has ever been killed off. Indeed, all of them are very much alive. Call the roll: the iron and steel group, lead, copper, zinc, aluminum, nickel, and so on down the line. All flourishing, thank you, in spite of the roar and confusion of the battle!

One of the latest dispatches from the front, published recently in a very readable article in one of our well-known business jornals, says:

> "Aluminum, with blood in its eye, is going after some of steel's structural markets. Copper swings haymakers at aluminum cylinder heads, silver takes a whack at tin-alloy bearings, while iron, lead and magnesium join in the free-for-all with a will. And nickel—which, unlike Rudyard Kipling's cat, refuses to walk alone—dashes from brawl to brawl, giving aid to all belligerents but missing few chances to deliver well-aimed blows on its own behalf."

Well, I suppose popular journalism must deal in the dramatic. The reading public likes its verbal blood and thunder. And there is no real harm in this picturesque form of literary indulgence—except this, that it seems to miss the main point in the advance of the metals. If this be warfare, it is revolution rather than civil war. And the revolt is against those two very old tyrants, ignorance and human inertia. There is a great difference between fighting *for markets* and fighting *against one another*. Fighting for markets is an advance movement that benefits industry and the general public. Any metal that is not fighting for public attention, aggressively campaigning to win a trial for this or that promising use or service, is not playing its part in the advance. As a matter of fact, the writer of the article, although he stressed the din of battle, reached the conclusion that metals help each other in creating new uses which benefit the public.

## Plenty of Room at the Top

If today we knew enough about the metals to make or do all the things that we shall one day be making or doing with them, the present production capacity of every metal would probably be wholly inadequate to meet the demand. Or if by some magic we could abolish the human inertia that necessitates our spending years and years convincing people-in-the-mass that they should accept and use the new things that industry creates for their welfare, the result would be the same. There would not be enough of any of the metals to go around. For metals enter into the construction or production of an amazingly large percentage of the things we use in our daily life.

The trouble seems to be that we are prone to mistake the daily competitive tilts - at - the - desk-of-the-buyer for bitter and sanguinary battles. There will always be keen competition for orders. It is probably best that there should be. It stimulates progress, improves service, keeps prices in line, and makes business interesting. But the advance of the metals is not actually made in the buyers' offices, at least not in a fundamental sense, any more than military advances are actually made by the troops in the front line trenches. They are usually planned and prepared long in advance in places remote from the field of action.

The story is told of a scene behind the lines in Manchuria during the Russo-Japanese War. One day during the thick of one of the most decisive battles of the Manchurian campaign, some newspaper correspondents came upon General Ku-

# *the Metals"...*

By S. K. COLBY
*Vice-President, Aluminum Co. of America*

roki placidly fishing in a stream near Japanese army headquarters.

"General!" exclaimed one of the correspondents, "you don't seem to be worrying much about the battle."

"No," replied the fisherman, "this battle was fought two years ago in Tokio."

If we must indulge ourselves in this "Battle of the Metals" metaphor, let us realize at least that the real struggle is going on far behind the sales lines, in the research laboratories, and that the plans are focused on a distant objective. Research men are working two, five, ten, twenty years in the future. In very few instances are they working on problems of competition as such, but rather of strength, durability, ductility, adaptability, finish, production economy, and the like. Campaigns of fundamental improvement, not petty competitive battles. Activities centered on increasing the usefulness and decreasing the cost of whatever metal they happen to be investigating.

The practical problems of competition which sales departments occasionally dump into the lap of research, rather quickly lose their competitive complexion when translated into research projects. It has been my experience, in thirty-odd years of contacting research men, that they are pleased when they have cracked a hard nut for the sales department, but they are inclined to think of their achievement in terms of solving an interesting (or perhaps baffling) problem in chemistry or physics that will make their metal basically more useful in the future. And in that they are sound.

In other words, at headquarters where the basic plans of an industry's advance are laid, the thinking is in terms of increasing the usefulness or economy of a metal so that increased tonnage will result as a natural consequence of increased market possibilities.

In the industry with which I happen to be identified—aluminum, the group responsible for the industry's development spends very little time talking, or even thinking, about competitive metals. Why should they? Their problem is to fit aluminum into tomorrow's scheme of things in ways and places where its particular attributes will make it useful and economical. If some metal is crowded out of a special corner which it has enjoyed to itself for years, aluminum may in time suffer a like fate and be crowded from some other corner by a steel or an alloy of cop-

per or zinc. No metal can hope to ride on yesterday's accomplishments or yesterday's reputation, in any field.

It would be foolish, we realize in our industry, to waste our powder —to resume the battle metaphor— shooting at competitors, when our real antagonists are the basic problems which stand between aluminum and its potential markets. Solving any one of these problems opens up a whole new field of usefulness, as for instance the recently developed Alumilite finish, which makes aluminum available for a broad new range of applications.

### New Uses Expand All Markets

Will such new developments steal markets from other metals? In terms of individual orders here and there, yes. But in terms of total tonnage, the effect will be slight. For one thing, new uses are being developed every year for all of the metals, which are broadening their markets to compensate for uses in which they are losing out. For another, a little horse-back estimating will quickly show how small are the actual inroads of even so up-and-coming a metal as aluminum in the markets of the older metals.

Take steel and aluminum as an example. In 1935, the domestic production of iron and steel in steel ingots and castings was 34,360,000 long tons, while the domestic production of aluminum was about 53,200 long tons, or approximately 0.16 of 1 per cent of the steel output. Assuming that a little over two pounds of steel is replaced by a pound of aluminum in the general structural field, where direct competition is possible, if the *total production* of aluminum had been devoted to replacing steel, aluminum might have replaced only about one-third of 1 per cent of the iron and steel production. Actually, the aluminum available for such competition, after supplying established aluminum markets, becomes less than one-tenth of 1 per cent! If double the 1935 production of aluminum were made available for such competition, it would require well over a hundred million dollars of capital expenditure to provide new aluminum production facilities, and even then the aluminum production would still be less than 1 per cent of the iron and steel production.

### Copper and Aluminum

Or consider copper. In 1935, the production of refined copper in the United States exclusively from ores was approximately 600,000 short tons, while the domestic production of aluminum was about 59,600 short tons, or approximately 10 per cent of the copper output. A conservative estimate indicates that not more than 25 per cent of the aluminum business is in competition with copper. Assuming that from two to three pounds of copper, depending on use, is replaced by a pound of aluminum, in the fields in which the two metals compete most actively, then in 1935 aluminum might have replaced only about 5 per cent of the total copper production.

Steel and some of the older metals have depended on the growth of the country for their own growth, and they may not grow at as rapid a rate in the future as in the past, because the country will not grow as fast. Furthermore, during the depression the tonnage went so low that the inroads made by the newer metals were exaggerated out of all proportion to their importance. But there is nothing in either situation to get excited about. There may conceivably be a readjustment in the relative standing of the metals in the future, but that does not mean that all will not continue to advance and enjoy great prosperity.

### Not a Question of "Substitution"

As a matter of fact, with all the metals it is now a matter of depending on brains and energy and know-how, rather than mere price or tradition or competitive sales tactics. We have pretty well run the gamut of easy substitution of metals. We must now go back and redesign along fundamental lines, if we are to continue to make marked progress. Streamlining is a term that has been overworked. But it is, nevertheless, symbolic of the necessary approach to the whole problem of rebuilding America and redesigning American life. Streamlining involves reducing the resistances that hold things back from *behind*—resistances of dead weight, ugliness, unsuitability, waste, wear, obsolescence, and high cost. Remove these drags and *all* the metals and materials will surge ahead.

### Each To Its Best Use

The engineers and designers and architects of America can be depended upon, in the years ahead, to take every one of the metals at its face value and use each where it will serve with the greatest efficiency and economy. Our common problem is to see that the various metals are ready in the needed alloys and forms and finishes, and that they work together in friendly fashion to produce machines and appliances and products that will give us all more for our money, in comfort, convenience, s a f e t y, health, and happiness.

***If this be war, let's all enlist!***

# Metallurgist's Role In Steel Making Takes on Growing Importance

Photo by Bachrach

H. W. GRAHAM

By H. W. GRAHAM
*General Metallurgist,*
*Jones & Laughlin Steel Corp.*

THE easiest discernible fact in iron and steel works metallurgy today, and perhaps the most important one, is that the metallurgist has in the past few years solidified his position in the industry to a surprising degree. It is substantially true to say that he came into the picture only in the early 1920's; and now, after 10 or 15 short years, the steel works metallurgist is accepted by and enjoys the thorough confidence of the manufacturing department, the general management, the sales department, the trade itself, and the general public. It is hardly disputable that there is nothing comparable in the history of human activities to the speed with which the metallurgist has introduced himself into the list of those departments which constitute the subdivisions of human labor and effort.

To this solidification of position which the metallurgist has accomplished, general economic circumstances and developments have contributed. In a sense the metallurgist is the man developed by the need of the times. But aside from these factors external to the metallurgist, he has strongly intrenched himself by sound use of his own capabilities.

Unbiased by commercial considerations, he has persistently sought the answer to the question: What are the true facts in this case? By adherence to the high ethics of scientific work and technical engineering, he has engendered in those around him the feeling that, here at least, is truth to be had—so far as it is known. No wonder that the metallurgist is rapidly gaining in the degree to which his associates depend upon him and have confidence in him.

## Now Has Wider Background

In a field of a complexity which the layman cannot even faintly grasp, the metallurgist has observed as clearly as he could and has recorded his observations until he now has a background, useful for further work, which was almost wholly non-existent 10 years ago.

And in the most recent years, through a mass of accumulated data, the metallurgist is beginning to grasp interrelations between observed phenomena, interrelations, that will greatly simplify and expedite further progress.

The metallurgist is beginning to see the inadequacies of former conceptions and to appreciate the importance of items heretofore overlooked or considered minor in character. He has grasped the fact that there is a field which might be called the metallurgy of minute quantities. He sees that these minute quantities of extraneous materials, largely gaseous or non-metallic materials or compounds thereof, strongly affect the ability of a piece of steel to adjust itself to external pressure either thermal or mechanical. He understands that these extraneous materials migrate thoroughly the ferrite base under external pressure, and that the rate and speed of such migration, together with the attendant adjustments in in-

(CONCLUDED ON PAGE 45H)

# A New Development in

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By THE METALLURGICAL STAFF
OF REPUBLIC STEEL CORP., CLEVELAND

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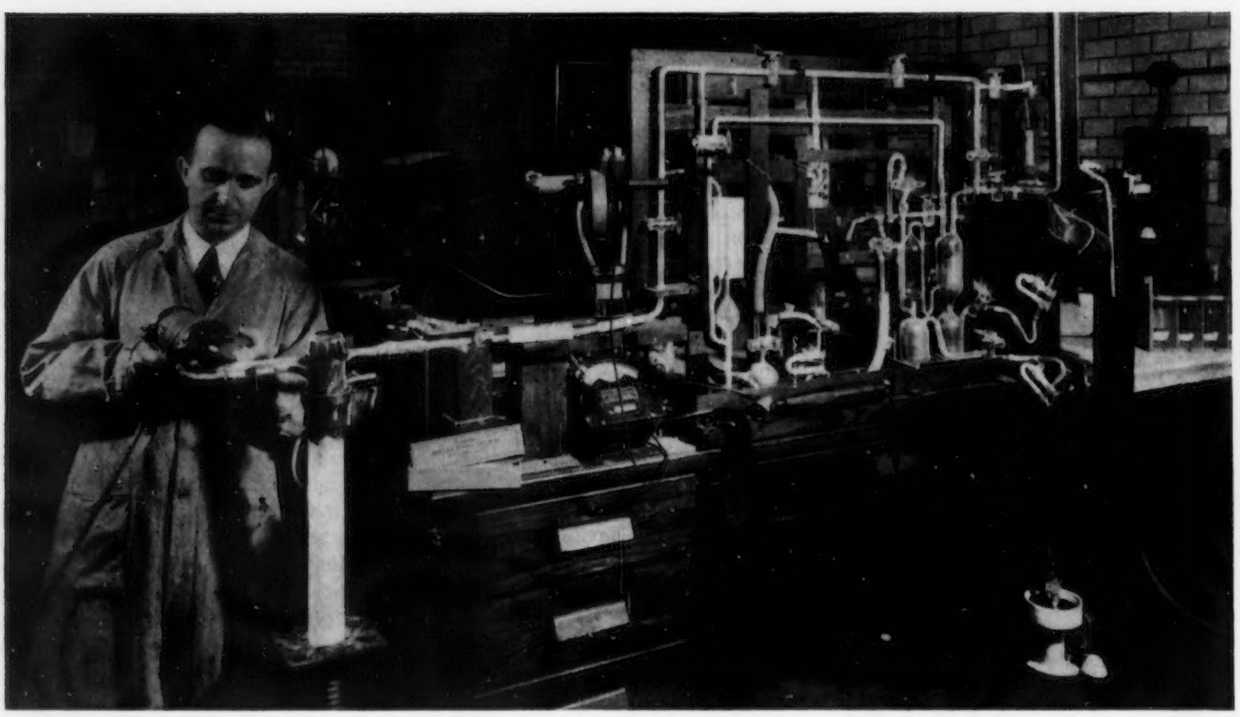
FUNDAMENTAL research, being an effort to prove a scientific theory or to find new methods of investigation, is of academic importance, and accordingly is restricted to schools and institutions until its findings can be put to practical use.

Many years of effort have been put into fundamental research, especially for determining methods for actual quantitative estimation of the amount and nature of the impurities found in steel. Considerable time and effort have been devoted to developing methods for determination of these impurities, but the numerous methods developed have been sooner or later changed for newer ones to keep abreast of the new developments in technique. Thus, none of these methods were definitely developed to a very fine degree of accuracy.

## Determination of Gases and Oxides

One fundamental research method which has a very important application in steel making is the determination of gases and oxides as well as other impurities found in steel. The gases, oxides and other impurities had not been heretofore accurately determined or their detrimental effect on steel suspected. Many methods were tried for determining gases and oxides in steels, the main thought back of these efforts being to find out the identity of the gases and oxides, their amount, their distribution and association in steel, *i.e.*, to actually determine the amount found in commercial steels.

The reason these gases and oxides had not been suspected as having a great detrimental effect on the quality of steel was because no methods had been available to



FRONT view of vacuum extraction apparatus. The sample is dropped into the furnace with an 8000-volt, 16-cycle magnet, as shown in the illustration.

# Steel Making Control..

accurately determine the existence and amount of each in steel. The ordinary methods of testing and analysis did not include the identification and determination of the amount of gases and oxides in steel.

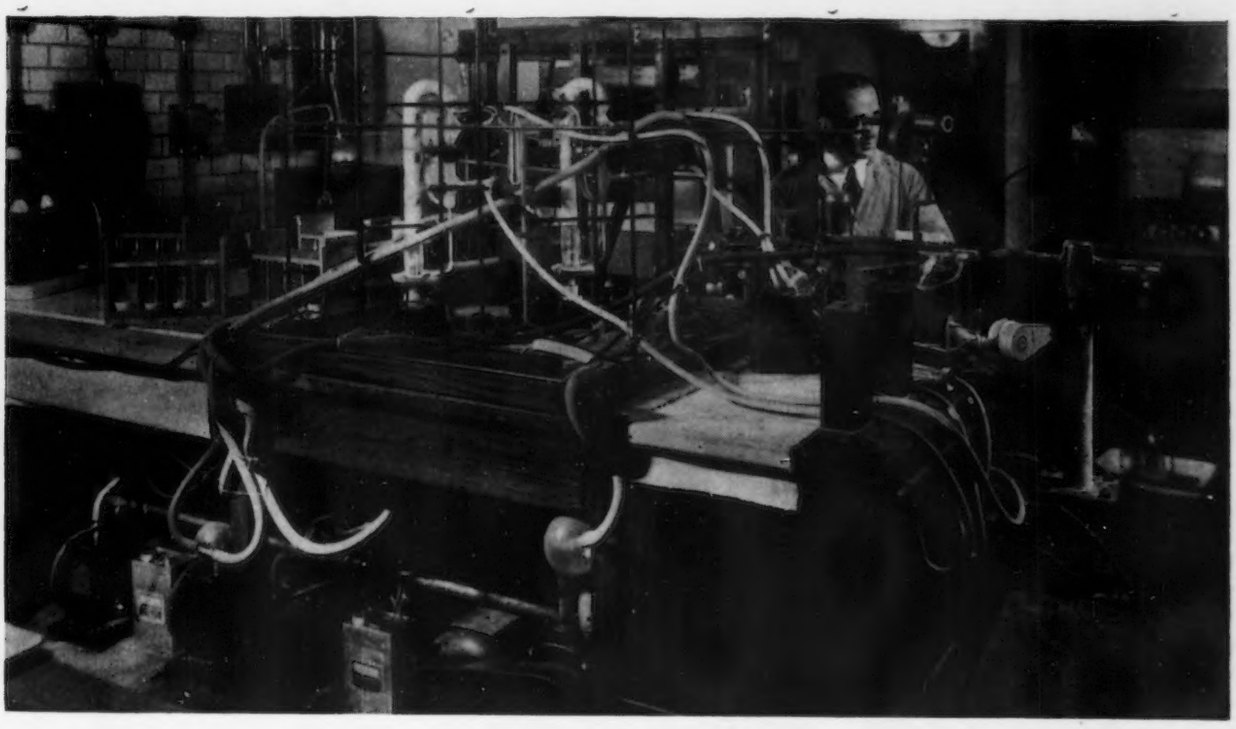
The gases and oxides in steel in some cases, if not in all, are the primary cause for failure in steel. The two most commonly used methods for determining these gases were the modifications of the Ledebur method for oxygen and the Allen method for nitrogen. The Ledebur method for oxygen determined the oxygen present as iron oxide or the high oxides of manganese, but failed to determine these oxides if they were combined with silicates. The Allen method for nitrogen was also incomplete, because it determined only the iron and manganese nitrides. The ordinary vacuum extraction in determining total oxygen content made no differentiation between the forms and combinations of oxides. In determining the quality of a steel the important thing to consider is not the quantity of total oxygen present, but the type, form and amount of combined oxides.

## Vacuum Fusion Method Used

To be able to differentiate between these oxides as well as to determine quantitatively the gases present, the vacuum fusion method by partial extraction at different elevated temperatures at which the iron, manganese, silicon, aluminum and other oxides are individually reduced, was developed. While the method itself is not new, modifications which were made in Republic's research laboratories take it out of the realm of fundamental research into the field of practicability, permitting its use in steel making problems.

The apparatus for the vacuum extraction of gases that has been developed by Republic is rather simple as are also its operations after the technique has been mastered.

The apparatus consists of an Ajax high frequency furnace in which is placed a silica combustion



BACK view of the vacuum extraction apparatus. The attendant is shown measuring the temperatures with an optical pyrometer.

tube and inside of this tube there is a crucible made of high grade graphite. The crucible is large enough to hold samples up to 250 grams in weight.

The sample of steel is placed in a holder which also acts as a sealing head. After the sample is placed in the holder the combustion tube is sealed to a continuous Pyrex glass member consisting of a McLeod gage for measuring pressures within the system, two mercury diffusion pumps in series to act as "pushers" for the gases evolved from the melt, reservoirs for collecting the gases and a Toepler pump to collect the gases at atmospheric pressures. The gases are collected over mercury in small vials and are analyzed in a standard Orsat gas analysis apparatus.

### Gases Extracted at Various Temperatures

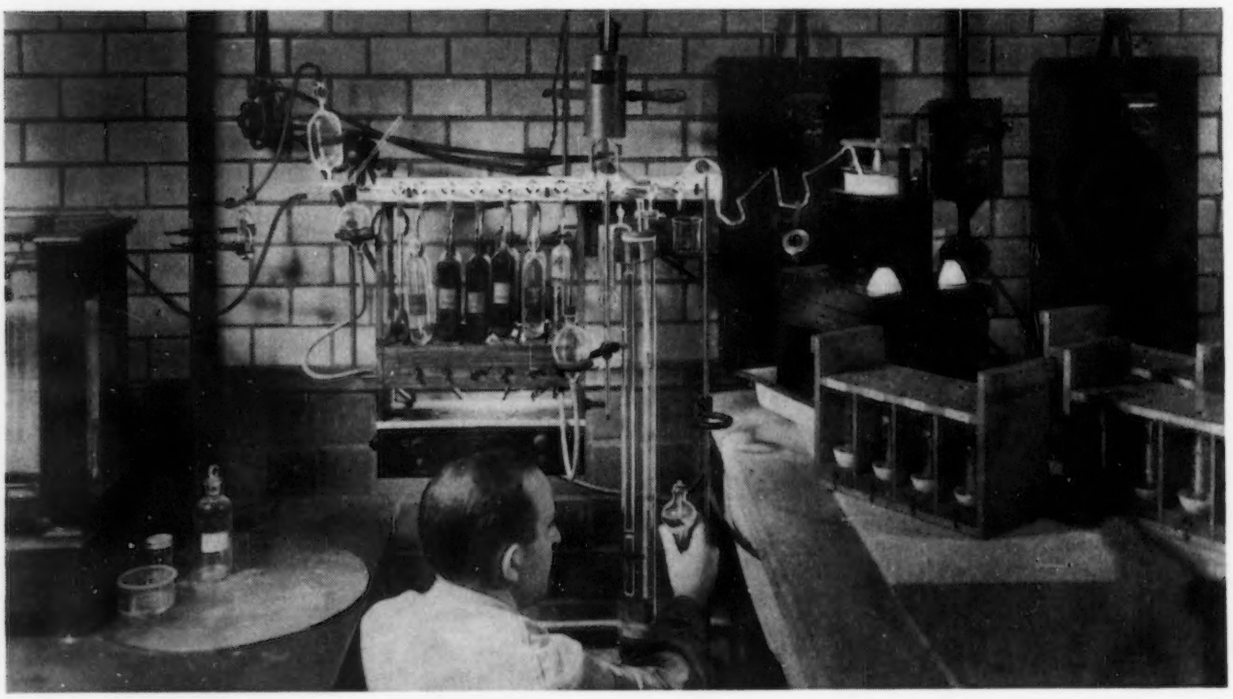
The entire operation is accomplished under a very high vacuum. The primary vacuum is obtained by the use of rotary piston vacuum pumps. The secondary vacuum or the vacuum available at the time of the extraction of the gases from the steel is supplied by the use of the Toepler pump. When the furnace tube is cold before or after an extraction is made, the vacuum is of the order of 0.0000001 to 0.00001 mm of mercury. The actual extraction of the gases is made at various temperatures with the various oxides reacting with the graphite crucible and evolving carbon monoxide at predetermined temperatures, (*i.e.*, FeO—1960 deg. F.; MnO—2140 deg. F.; $SiO_2$—2460 deg. F.; $Al_2O_3$—2900 deg. F.). To completely reduce these oxides, the steel must be molten, and for that reason pure tin is used to alloy the steel, providing a low melting alloy. Oxygen and nitrogen are given off at various temperatures, the nitrogen almost completely at 1960 deg. F., except the nitrogen existing as nitrides of silicon and aluminum.

When operation is started a vacuum is obtained throughout the entire apparatus. Then the crucible is heated at 3400 deg. F., to eliminate all contaminating gases, after which the furnace temperature is lowered and the tin is dropped into the crucible in order to extract any gases which might be present in that metal. Then the steel sample is dropped into the crucible where it fuses with the low melting tin. The temperature is held at this stage until the reaction is completed and the gases are collected in a vial over mercury. For the next reaction the temperature is raised and the gases collected and each successive stage is carried out in the same manner. The gaseous products are analyzed as such by diluting with a purified gas. An amount as small as 0.2 cc. can be analyzed. The furnace temperatures are measured with an optical pyrometer.

### Proper Interpretation Necessary

The results obtained by this method, or any other method, are useless without proper interpretation. To give them proper interpretation, the entire history of a sample of steel must be available to the operator along with the physical and chemical data. With all this it is possible to place a finger upon the cause or causes for a steel being "good" or "bad," which causes are not recognizable from the chemical and physical data alone.

The usefulness of this equipment as a means of steel making control is evident from the results obtained during the last two years of actual application. Numerous grades of steels and irons have been examined with this method and much valuable information has been obtained on the quality characteristics of steels and irons. The results obtained with this method are the strongest evidence for establishing such control for steel making process.



GASEOUS products are collected over mercury and are analyzed in a special gas analysis apparatus.

# Steel Engineers Debate Production Problems

MORE than 4500 engineers of the steel and allied industries met last week in a three-day session at the 32nd annual convention of the Association of Iron & Steel Engineers at Detroit to talk over their mutual production problems. In this most successful meeting of the Association, eminent authorities in their respective fields presented 35 technical papers dealing with all phases of the production, processing and utilization of steel. Visitors also had opportunity to inspect a display of over $3,000,000 worth of steel and steel making equipment spread over 50,000 sq. ft. of floor space. And on Wednesday afternoon, about 850 visitors took advantage of an opportunity to visit Great Lakes Steel Corp. and look over the new 96-in. continuous mill in operation. Friday morning 650 visited the Ford steel mill.

In the Wednesday morning technical session, Joseph Winlock, chief metallurgist of the Edward G. Budd Mfg. Co., reviewed in a highly interesting manner the currently important subject of qualities of sheet and strip steel favorable to deep drawing operations. It was pointed out that a discussion of steel for deep drawing can be undertaken only with a full realization that the manner in which the draw is accomplished is, within limits, just as important to the success of the operation as the physical properties of the steel itself. Mr. Winlock showed, therefore, that in examining the problem it was necessary for him in many cases to discard theories and depend on practical observations on the action of metal during the drawing of unsymmetrical and complicated shapes.

Mr. Winlock pointed out that the steel most widely used today for deep drawing purposes is a plain carbon basic open-hearth steel containing under 0.10 carbon, under 0.35 manganese and low phosphorus and sulphur. There are two general methods for producing this steel: (1) the sheet method and (2) the strip method.

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JOSEPH WINLOCK

THE qualities of steels most amenable to deep drawing were reviewed.

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The essential difference between the two methods is that in the strip method a large part and sometimes all of the rolling is done in one direction, whereas in the sheet method the ingot is first rolled to a sheet bar and then cross rolled to the approximate finished gage.

However, whatever method is used, the general outline of procedure consists in a series of hot rollings, cold rollings, annealing operations and pickling operations. The number and sequence of these operations depend in part, also, upon the deep drawing qualities and the surface qualities needed or desired in the finished product.

Both rimmed or effervescent and killed steels are used in the manufacture of steel for deep drawing purposes. However, according to Mr. Winlock, the present tendency is to use the rimmed steel almost entirely. If this process is correctly carried out, an ingot is produced which has a thick skin of dense metal surrounding a core of spongy metal which contains most of the impurities. The blow holes in the center of the ingot readily weld up in subsequent rolling operations and the thick skin of metal results in better surface qualities. The selective method of freezing, although it is of advantage in yielding a good surface on the sheets, tends by its very nature to produce non-uniformity of the finished product. This is unfortunate, but like many other things a compromise must be made.

Mr. Winlock went on to show how all the manufacturing operations involved in the making of steel have some influence on how the steel may function during deep drawing. It was pointed out, for instance, that neither a very large or a very small grain is desirable for consistently successful deep drawing. The E. G. Budd Mfg. Co. has found that a grain size of approximately ⅛ in. in diameter at a magnification of 100 diameters is best suited for general purposes. Stated more scientifically, this grain size may be expressed as 81.4 grains per sq. in.

at 100 diameters, 814,000 grains per sq. in. at zero magnification or 1270 grains per sq. mm. Such a grain size, according to Mr. Winlock, seems not to be so small as to impart to the steel too great a "toughness," nor too great a stubbornness in removing stretcher strains, nor too great a difficulty in removing buckles. At the same time it is not too large to pull coarse on deep draws except perhaps on some stampings such as fenders where a smaller grain size is indicated.

Mr. Winlock went on to point out that cold rolling in the steel mill was primarily an operation for obtaining good surface quality, uniform gage and flatness. Reductions in thickness are seldom more than 3 per cent. Strip steel is cold rolled for the same reasons, with the additional purpose of rolling to the lighter gages. In the case of strip steel, the reductions effected by cold rolling are usually 20 per cent or more and often are as high as 60 per cent. Different amounts of cold rolling affect deeply the physical properties of the steel even after a subsequent annealing operation. For example, if the reductions by cold rolling are small, say 3 to 5 per cent, the grain size after a low temperature anneal will be extremely large. A steel having a large grain size will produce an objectionably "coarse" surface on the stamping after the drawing operation and is more susceptible to "Stead's" brittleness. On the other hand, large reductions by cold rolling tend to produce a very small grain size which renders the steel susceptible to the production of "stretcher strains" in the finished stampings (peculiar lines of depressions or elevations which occur in drawing annealed steel—sometimes called "worms" in the press shop) that the removal of these presents one of the greatest difficulties encountered in the deep drawing of steel.

Cold rolling as a final operation in the mill will prevent the occurrence of stretcher strains, but the ductility of the steel is often seriously affected and the tendency to "age" (spontaneous decrease in ductility) is increased. It has been found that steel in the semi-plastic state is best suited for deep drawing because of its ability to stretch more evenly. That is, suppose that enough permanent deformation or cold work is imposed on the steel, before the deep drawing operation, so that all or most of the grains have partially slipped. Any subsequent deformation will for the most part be of a plastic nature.

Sheet and strip steel may be cold-worked to produce this condition either by cold rolling, roller leveling or stretcher leveling. At the E. G. Budd Mfg. Co. plant it has been found necessary that in order to obtain consistent results the steel should be roller leveled within the 24-hr. period preceding the drawing operation. Cold rolling is a more drastic form of cold work and consequently longer intervals may elapse before the metal will recover from the effects of the overstrain thus produced.

MARCUS A. GROSSMANN

MOTION pictures depicting the heat-treatment of alloy bar stock were presented.

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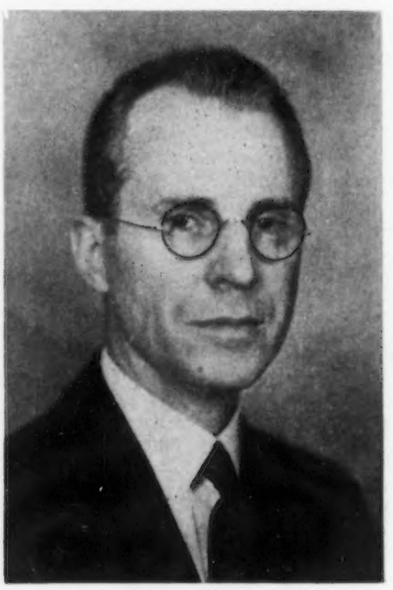
## Annealing and Normalizing

Presenting a paper dealing largely with the present status of bell annealing and the initial findings of a normalizing research program without any attempt at long-range prediction of ultimate possibilities, F. T. Hague and P. H. Brace, Westinghouse Electric & Mfg. Co., contributed an interesting discussion on the annealing and normalizing of autobody steel in electric furnaces.

The authors pointed out that the two approaches to the problem of heat-treating cold-rolled sheet in making it suitable for pressing operations are normalizing and annealing. The final operation in making autobody sheets is a cold-rolled reduction in thickness of approximately 50 per cent, which leaves the steel hard and comparatively non-ductile. To give this steel the combination of softness and ductility most favorable for deep drawing, the steel supplier has the alternatives of using a continuous normalizing process of less than 10 min. or a bell annealing process requiring from 48 to 120 hr.

The author pointed out that each process at this stage of development produces steel with different characteristics, both suitable in varying degrees to the common requirement of deep drawing. It was indicated that "rimmed" steel was generally used for autobody sheets, and figures were presented showing variations in analysis of various heats. Since there is no fixed chemical composition it follows that considerable variance in the steel's response to heat treatment may be expected.

In addition to variance of mean composition, there are local variations within ingots due to segregation and chemical changes resulting from rimming action, which may produce a 4-to-1 ratio of carbon content and a practically carbonless peripheral zone. These composition variables gave rise to a wide scatter in ductility and hardness which was quite baffling until the situation was clarified by identification of the steel with respect to its location in the original ingot and with its chemical analysis. *It was then apparent that coils made from different portions of an ingot may give widely differ-*



P. H. BRACE

THE advantages of modern normalizing furnaces, as compared with bell annealing were pointed out.

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*ent annealed properties and that they might have widely different chemical analyses.* With a knowledge of the probable dispersion within an ingot and the effect on physical properties of variations of carbon, manganese, sulphur, chromium, etc., the authors found it possible to study the results of a given annealing or normalizing cycle.

Discussing the user's requirements, the authors pointed out that the user of autobody stock has easy, medium and deep draw applications and it is not a requirement of the annealing process that all the product meet some difficult deep draw test. Under the best conditions of bell annealing, a variation of 20 points Olsen is frequently met with on coils from a single ingot and a range of 40 points can be expected over a range of ingots from different suppliers. Thus, it will be seen that a commercial grade of "rimmed"

F. T. HAGUE

A 9-MIN. continuous normalizing cycle for low-carbon steel sheets was described.

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ingot steel forms a reasonably satisfactory raw material for the manufacture of autobody stock so long as a reasonable percentage of deep and medium draw stock is produced.

## Normalize Soon After Cold Rolling

Reviewing the question of age hardening of cold-rolled stock, the

F. M. GILLIES

VARIOUS improvements possible in material handling equipment were mentioned.

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authors told of investigating this phase of the problem. The effect of such age hardening upon the maximum ductility obtainable after normalizing was investigated after difficulty was encountered early in this investigation in securing consistent results. On each lot of steel tested, the Olsen values developed by any particular normalizing cycle were higher when the steel was normalized and tested within a few days after receipt at the laboratories than when normalized after a lapse of some months, and immediately tested. Data were compiled from tests on only three different steel shipments and showed indications of a trend of age hardening characteristics rather than as final data applicable to all cold rolled steel. The importance of recognizing this characteristic is obvious in developing the maximum ductility by normalizing. The cold rolled steel should apparently be normalized within two weeks of cold rolling, otherwise a serious loss of possible ductility may be experienced. All testing samples should be dated when cold rolled, otherwise the possibilities of obtaining good ductility may be masked by the age-hardening characteristic.

The authors adequately describe the bell annealing furnace and then explain that a research study was begun for the purpose of developing a short continuous normalizing cycle for autobody sheets of 19 and 20 gage. Their studies indicated that the total cycle time should be less than 10 min. to keep the process within competitive range of present annealing practice.

From valuable data obtained, the authors proceeded further into the study evolving a comprehensive test program. From this study of a conventional heating and cooling cycle, it was concluded that such a cycle might be divided into four parts for purposes of research, i.e. (1) top temperature, (2) first cooling, (3) shelf—which may cover either a re-heating, a sustained temperature, or a sloping temperature condition, and (4) final cooling. The assigned total cycle time was taken as nine minutes and the problem became one of demonstrating what could be accomplished within this time using time temperature cycles reproducible in continuous furnaces of convenient construction.

Discussing the metallurgical studies, the authors pointed out that an average sloping shelf temperature of 930 deg. F. produced minimum hardness. Rather unexpectedly, the hardness was found not to correlate with the carbon content of the strips. The experimental results seemed to indicate a correlation between hardness and sulphur content which was unexpected, inasmuch as sulphur is generally not considered to be a hardening element.

The general shelf condition may take the form of a re-heat shelf or the preferred sloping shelf. Various graphs have been prepared which show comparative results for the preferred sloping shelf cycle which gave the best results of any re-heat cycles tested. The hardness in all three cycles is approximately the same, but the usual experience with re-heat cycles has been that, if the length of the re-heat cycle is reduced much below 12 min. by shortening all parts of the cycle proportionately, or by omitting the shelf feature, lower Olsen and increased Rockwell hardness figures result.

From the metallurgical standpoint, there has been developed a 9-min. cycle for the continuous normalizing of low-carbon steel sheet whose distinguishing features are a quick heating to 1740 deg. F., a fast cooling to an intermediate temperature range (1020 to 840 deg. F.), a cooling at a slower controlled rate through this shelf, and, finally, a relatively rapid cooling to approximately 280 deg. F. Olsen ductility values averaging substantially more than 0.400 in. were obtained in applying this cycle to a number of samples of steel from

different ingots and from different producers. According to the authors, these values compare favorably with values obtained for steel after bell annealing or re-heat normalizing, and were obtained in a time of 9 min. as compared with 2 to 5 days for the bell annealing and at least 15 min. for the re-heat shelf normalizing. Rockwell hardnesses of 50 to 60 on the B scale were obtained, which values, while higher than are obtained by bell annealing, are low enough that normalized material can be substituted for bell annealed material in commercial processing, except for the deepest draws.

This cycle was found to have peculiarities. The hardness was found not to correlate with the carbon content of the steel, as is indicated in bell annealing, and was unfavorably affected by the presence of sulphur and chromium. Later work gives promise that, by modifying the cycle, it will be possible to develop, in normalized chromium bearing steel, properties as good as those developed in low chromium steels. The heat treatment response was most favorable when the cold rolled stock was normalized within two weeks after cold rolling.

The authors are unable at the present time entirely to evaluate their test results because a sufficiently wide experience has not yet been accumulated on the correlation of these characteristics with the performance in dies. According to the authors, it appears that fine grained normalized steel has less tendency to "orange peel" in drawing than is the case with the present commercial grades of bell annealed steels. It also appears that normalized steel has a somewhat better characteristic than the bell annealed with reference to permissible speed of deformation on medium draws without causing failure, although it will not take as deep a draw as bell annealed steel. The normalizing treatment seems to give the steel the characteristic of being able to undergo deformation at a high rate of speed without tearing. This has advantages in that press speeds might be further increased to take advantage of the better handling conditions resulting from the use of coil stock instead of sheets.

It has also been indicated that operating advantages exist through the use of continuous normalizing furnaces in that material can be processed in a matter of a few minutes instead of many hours or days. This is a distinct advantage in matching up with other line production activities, holds investment in stock to a minimum and frequently avoids delays that might otherwise amount to 2 or 5 days' time. It has proved to be a tool which appeals to a production minded organization.

Speaking of future possibilities, the authors indicated that the sheet normalizing furnaces built to date have been of conventional construction, the sheets being heated by radiation from wall heaters and cooled by fan circulation of an atmosphere through coolers. The cost and length of a furnace are closely controlled by the heating and cooling chambers. The Westinghouse Research Laboratory holds forth the promise that either or both of these present limitations may be modified, provided industry finds normalizing sufficiently attractive to warrant continued development. The steel may be brought to soaking temperature quickly by passage of current through the sheet, thereby shortening the heating chamber, reducing the amount of wall heaters and improving economy. Similarly, there are attractive possibilities of faster cooling between the soaking temperature and the shelf temperature that will eliminate fan circulated atmosphere as a cooling medium and replace it with water cooled means. The work of the authors has already disclosed that using a sloping shelf cycle, the final cooling chamber may be entirely replaced by a quench chamber. These and other possibilities are still in the laboratory stage of development and cannot be properly evaluated at the present time.

## Heat-Treating of Bar Stock

Prefaced by a brief description of equipment Dr. Marcus A. Grossmann, director of research, Carnegie-Illinois Steel Corp., Chicago, presented interesting motion pictures of actual operations of electric furnaces in the heat-treating of alloy bar stock.

According to Dr. Grossmann, the equipment consists in essence of two bell-type electric heating furnaces and one quenching tank, all large enough to handle bars up to 30 ft. in length. The outstanding feature of the equipment is the uniformity obtained in the heat-treating operations. "This uniformity is promoted on the one hand by the design of the furnaces for uniform heating, and on the other hand by the automatic timing of the crane motion and of the quenching operation.

Each furnace consists of a car bottom, upon which a rectangular bell-type heating chamber descends when the furnace is in use. The car bottom is so arranged that the load of bars rests on elevated racks of heat-resistant alloy. The bell-type heating chamber descends and rests on this car, the whole being closed by an oil or sand seal. The heating elements are in the bell-type cover, and are so placed on the sides and roof as to give uniform heating of the load.

When the load is ready for quenching and tempering, these operations are then carried out almost entirely automatically. That is to say, the bell is raised and the subsequent operations are carried out automatically by proper setting of the electrical equipment. Pulling out the furnace car, raising the load by means of the crane, moving the crane over the quenching tank, quenching the steel for a predetermined number of seconds or minutes and transferring the quenched steel to the car of the tempering furnace. The tempering furnace has already been brought to temperature, the car is moved into the furnace, the bell is lowered and the tempering operation is carried out immediately.

## Developments Reviewed

As has been customary in previous years, W. H. Burr, electrical and mechanical superintendent, Lukens Steel Co., reviewed steel mill developments during the past year and a similar review of developments in flat-rolled steel was given by Stephen Badlam, consulting engineer of Pittsburgh. To a certain extent the two papers overlapped, since the principal developments have been in continuous strip mills and related equipment during this time. Mr. Burr indicated that the outstanding development of the year, as far as the industry as a whole is concerned, has been the increased demand in all lines for steel and its products. Increase in steel mill operations has brought about a shortage of skilled craftsmen and he thought one of the greatest opportunities to reduce costs lay in the personnel department.

Both authors noted a trend toward wider and faster mills of the continuous type operated up to 2000 ft. a min., and, because of the increase in size, a corresponding increase in the concentration of electrical power, such as on the Great Lakes' 96-in. mill, where 40,000 hp. is concentrated in one motor room. During the ten years since the first continuous mill was installed at the Butler, Pa. plant of the American Rolling Mill Co., there has been a tremendous increase in the tonnage produced on continuous mills. Over the 10-year period, average output was 1,000,000 tons a year. For the past two years it has averaged 5,000,000 tons and by the time the new Jones

& Laughlin 96-in. mill gets into operation in early spring, the annual capacity of continuous strip will be 11,000,000 tons. While most of the mills put into operation in the last few months or about to be started represent huge investments in new machinery, there is one exception in the Granite City mill, where initial costs have been reduced tremendously through the use of two existing plate mills.

As regards pickling of strip, it is noted that there is a tendency toward further use of continuous pickling lines with increased length of tank and a higher speed through the tank. There has also been developed an entirely new principle of pickling strip in coil form through the central mast idea and a method of mechanically rotating the coil in the bath while the acid is circulated at the same time, thus obtaining accelerated action.

Much of the progress in steel mill development is attributed to contributions of the electrical industry. So-called skin pass mills or tempering pass mills are now requiring a more elaborate electrical equipment than has heretofore been considered necessary. In addition to the mill and tension reel motors, a skin pass mill is now often equipped with a so-called "puller," which is located between the mill itself and the tension reel. Through electrical devices, the tension of the sheet both entering and leaving the rolls is accurately controlled so that uniformity of the finished product is much more easily maintained. Through a series-parallel hook-up it is possible to get a 15 to 1 speed range on reel motors, which also adds to flexibility. Instruments are now available to measure roll neck bearing loads and hence the load on the sheet and through electric recording equipment to assure automatic uniformity of gage.

In hot mill practice, differential speed cooling tables have been introduced whereby it is possible to cool the sheet more in the front than in the back, so as to make the sheet of uniform temperature as it enters the finishing train. This has been a great aid in obtaining uniformity of gage of hot-rolled strip.

Sleeve-type main roll bearings with forced feed lubrication have been widely adopted in the past year. On the other hand, the ability of certain spherical roller bearings to take thrust in both directions and sustain this load under misalinement has been utilized in the application of this type of bearing as a thrust carrier for back-up

W. H. BURR

DETAILS were given of specific developments in continuous hot strip mill installations.

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rolls in a great number of four-high hot and cold rolling mills.

Mr. Badlam devoted a considerable part of his paper to the social and economic aspects of the introduction of modern high-speed equipment on a large scale. It is his contention that the introduction of more efficient machinery has not reduced the number of employees nor the cost of labor per ton rolled. He took some figures from the annual reports of the United States Steel Corp. to indicate that in the five-year period from 1902 to 1906 labor cost averaged $15.04 a ton, with 20.8 employees per ton, whereas in the five-year period of 1931 to 1935 inclusive, labor cost ran $33.88 a ton and 31 persons were employed per ton produced. In the interim, hourly rates have risen from 30 to 70c. Decreased costs and increased quality widen the market for a product and in the long run add to the payroll. On sheet products, the ratio of wages to sales has been maintained despite technological advances. Citing the automotive industry, Mr. Badlam stated that the cost of parts for cars today would be double those of 1926 had no changes in steel mill practice taken place. Furthermore, deep drawn fenders would have been simply out of the question. As a result of technological improvement, hourly wages have gone up 30 per cent, while working hours have been cut in half, a large amount of the drudgery has been eliminated and the mills made much safer. The customer gets a better product at a lower cost. In fact, the only one who has received no advantage so far is the stockholder.

Mr. Burr, in his paper, touched on improvements in material handling equipment and later F. M. Gillies, assistant general superintendent, Inland Steel Co., devoted a paper to material handling in hot strip mills. Both pointed to the development of tractor units of much larger capacity than had heretofore been available, capable of handling up to 16,000 lb. of coil stock on ram type trucks. From remarks made by these men and also from comments from the floor, it was generally agreed, however, that a higher factor of safety could be built into these machines since all material handling equipment is s e r i o u s l y overloaded. Despite articulated trucks and multiple wheels with wide rubber tires, these mobile units still give floors a lot of punishment and builders of this type of equipment were asked to devote some thought to developments along these lines. The tractor type unit seems particularly applicable in the cold roll mill, whereas the overhead crane still seems to be the handiest equipment in the hot mill department.

In transferring hot coils to the storage building, power-driven chain conveyors are generally used. High maintenance costs will be encountered if this equipment is not properly built, since the slow moving chain in direct contact with hot coils must not expect much in the way of proper lubrication and therefore must be built strongly enough for long resistance to severe treatment.

Gravity roller conveyors are desirable wherever possible for coil stock where it is handled in a vertical position but power-driven types have their advantages, particularly in spacing stock to prevent damage in transit. Where a number of feeder lines are employed, they should be electrically inter-locked so that no material is fed into the main line when that line itself is not running. Mr. Gillies believes that more attention should be paid to the selection of material handling equipment because it has such a direct relation to manufacturing costs. He believes that active supervision of the handling crew so as to prevent damage to product and process would well repay the cost. Mill layouts should be based on handling facilities so as to eliminate conflicting movements and backtracking of material.

# Rush to Train Skilled Workers

SKILLED labor shortage is being keenly felt in some sections of the country and various means are being taken by manufacturers in metal-working lines to build their forces back to the conditions that existed prior to the depression.

Homer D. Sayre, commissioner of the National Metal Trades Association, tells THE IRON AGE that several recent surveys that have come to his attention have indicated in a rather striking manner the effects of economic conditions during and since the depression which have resulted in substantially reducing the number of skilled workers available for industrial employment.

"The problem of unemployment has been attacked by employers and public officials throughout the country without any marked reduction in the numbers unemployed in certain important occupational classifications," said Mr. Sayre. "However, according to the New York *Sun's* recent report of its survey of employment in the manufacturing and mechanical industries, it is shown that the number of workers employed by these industries in 1935 equalled 93.6 per cent of the number employed during the boom period of 1929. This percentage of employed persons was further increased in 1936, which indicates that the manufacturing industries have reduced their share of the unemployment burden to a negligible amount that will soon be eliminated by expansion of industrial activity. This excellent showing effectively refutes the claim that industrialists have been laggards in providing employment. Although industry has increased the number employed to approximately the 1929 level, there is a marked shortage of highly skilled mechanics.

"The shortage of skilled labor, as reported by the National Industrial Conference Board, are based on an estimated obsolescence and mortality rate among skilled workers of over 5 per cent annually and a total shortage in 1935 of over 120,000 skilled workers which approximates 6.74 per cent of the total employment in the manufacturing industries. Using their estimates, it is apparent there is at present an accumulated loss of 30 to 40 per cent of the number of skilled mechanics available in 1929.

"Combining the foregoing factors, it is evident that industry is now employing approximately 95 per cent of the number employed in 1929 and has only 60 to 70 per cent as many skilled mechanics as were employed by them in 1929.

### Training Had Been Set Down

"During this same period about 7 per cent of the apprentice training programs in industry were suspended, many others were reduced to such an extent that they became relatively ineffective, and quite a number of the apprentice training programs which continue to operate have been so handicapped that they have been unable to train an adequate number for replacements based on the reduced requirements of the depression period. In practically all cases, manufacturers have failed to provide training facilities for developing an adequate supply of skilled workers based on improving conditions.

"Public school programs, which had been developed for the purpose of assisting industry in the training of apprentices and other workmen, in many cases were almost destroyed by elimination of classes made necessary by reduction of budgets to meet reduced revenue because of failure to collect taxes. Further, business uncertainty during the depression, in many cases, caused skilled mechanics to refuse part-time employment in industry for such a long period that some of them have lost part of their skill and others later found other work that was equally satisfactory and lucrative which will prevent the return to industry of quite a group of mature skilled workers.

"When you recall the inadequate supply of skilled mechanics during the boom period of 1927-28 and then subtract from that number the losses experienced since that time, you will be able to recognize the growing seriousness of the acute shortage of skilled labor which we are facing. This shortage of highly skilled workmen is becoming a menace to the profitable operation and survival of manufacturing industries.

"It would be interesting to know what the relationship is between this shortage of skilled workmen and the three- to four-fold increase in the number of employees on strike during 1933-'34 and '35 since the strikes were not based on economic factors in most cases. As a rule an adequate supply of skilled labor is an effective means of control in dealing with industial relations.

# As Labor Shortage Grows

"The wide significance and importance of this problem should induce every manufacturer to immediately develop and put into practice comprehensive and effective training programs before a possible emergency causes them serious embarrassment. The long-term benefits resulting from properly training an adequate number of apprentices and skilled operators in addition to eliminating the skilled labor shortage, will enable management to more effectively control their production without interference from outside sources.

### Urges Immediate Training

"We know we need skilled help now that it is not available and that any upturn in business will make the need much more apparent. We know we are not training an adequate number of men to meet our needs. The necessity of developing high grade workmen for our industries, therefore, must become the concern of every plant manager and each must do his full share of this job."

### Cincinnati Situation Comfortable

At Cincinnati, where the employment barometer of the National Metal Trades Association indicates 12 per cent more employment now than in 1929, there is no present shortage of skilled labor in the metal trades, such as is being felt elsewhere, but there are special reasons for this comfortable situation. The closing of the Remington-Rand plant at Cincinnati released about 1700 skilled and partly skilled workmen and afforded relief to the labor stringency. Of these men, about 600 are machinists and the remainer are trained shop hands of various types. So far, about 300 have been absorbed by industries outside of Cincinnati, while the remainder are being taken over by Cincinnati plants.

The Cincinnati labor barometer, using the average of 1925-26-27 as base, stood at 118 per cent in 1929 and is now at 130 per cent, but the higher figure now in effect is accounted for by a reduction in working time. The 1929 work week was from 48 to 50 hr., while the present week averages 44 hr.

Apprentice training is being pushed by all sizable companies. Two of the larger Cincinnati plants maintain a constant apprentice class of 100, while the other companies try to have a steady apprentice group equal to 5 per cent of the shop force. This latter figure represents the customary shrinkage in forces through death, promotion, change of position and similar causes. Thus, these companies insure themselves of a steady flow of help. Basic educational requirement for admittance to apprentice classes is a high-school education.

In addition, the Ohio Mechanic's Institute and the Metal Trades School, a part of the public school system, also train substantial groups. These courses, however, are not sufficient to produce completely trained men, but the subsequent apprentice period is shortened by one and a half to two and a half years from that of the shop beginner.

Skilled labor shortage in the Chicago area has become progressively more severe as 1936 has advanced and the fall months not only promise no relief, but the outlook is that the situation will steadily grow worse. Industrialists have combed the immediate Chicago area and have gone 300 to 400 miles away to seek men. Likewise small industrial areas in outlying districts have come to the city for help but with very limited success.

### Chicago Shortage Acute

The matter of skilled labor is only part of the problem. There is a definite shortage of foremen and supervisors and in some areas common labor has been lapped up to the point where only the lazy, worthless and unemployables remain, and many of these, who might under stress be pressed into industrial service, prefer the easy cushion of governmental subsidized work and jobs.

Severity and length of the depression caused most plants to cut organizations to the bone. Assistant foremen were often dropped and after six years many of the foremen who remained have aged to the point where physical strength will not permit them to hold up under today's strains. There is an urgent call for foremen under 45 years of age, but they are to be had in a very limited number. Some who might qualify cannot now find themselves and climb above the lazy, dole attitude.

### Older Men Find Jobs

The result is that men above 60 years of age are being accepted

and every effort possible is being put forth to train understudies who it is hoped can take full responsibility within five to 10 years. The source of many of these understudies is from the ranks of tried and capable workers who are ambitious.

Machinists, tool makers, die makers, molders, pattern makers, and all other skilled classifications are caught in the whirlpool of labor shortage. Take for instance the case of molders whose average age in 1929 was 48 years. These men today as a group average 55 years. Infirmities of age have cut many of them from the active lists and others must soon retire. Still others, softened by inactivity, cannot get back into the stride of shop work. No molders have been trained in seven years, and this is true in other skilled groups.

The immediate solution and the one being widely adopted is to search for semi-skilled and partly trained men of ambition and push them forward as fast as possible, in other words it amounts to a dilution of the skilled ranks, yet this is imperative.

Skilled men, who during the depression sought steady income by opening taverns, filling stations, lunch stands and the like, are seven years older than in 1929 and many of them prefer to hold to the small and relatively steady incomes from these new occupations rather than to encounter the uncertainties of income from production schedules.

Apprenticeship plans, neglected during the depression, are again functioning and much stress is being placed on them as the only real source from which the skilled workers thinned ranks can be filled. High schools and continuation schools throughout the country are cooperating and excellent work is being done by such groups as the American Foundrymen's Association, National Metal Trades Association and the National Founders Association.

The only other directions to which industry can turn are automatic machines such as die tracers and sandslingers. But not even this equipment can be manned without some skill, but it does lend itself to the dilution idea.

The only answers now are: to take available men; select the most promising and push them forward as fast as possible thereby diluting the skilled ranks; give intensive training to foremen and see to it that the best possible supervision prevails from top to bottom; start apprenticeship courses, and expand those in existence because at best it will be two to three years before those students can step into the ranks.

### Shortages in New York

In the New York area there are shortages in certain classes of workers and a possibility that a more serious condition may result if business continues to improve. The past five years have taken a toll in skilled labor ranks in age limitation, death and employment at other kinds of work.

Regret has been expressed by employment executives that the administration in its large spending program has not seen fit to provide means for mechanical training in order to prepare the unemployed for skilled or semi-skilled work. It is felt that much of the burden of mechanical education, now assumed by industry, might well have been carried on with funds diverted to other purposes, so that both industry and the unemployed would benefit.

About three years ago some executives foresaw an eventual shortage of skilled workers and reestablished shop training. This has developed along lines not hitherto used because of the need for greater haste in filling the ranks of skilled workers. Instead of youth apprenticeships, many older men are being taught. For example, many plants have had a "helper" class of employees, made up largely of men with mechanical bent but lacking detailed or technical knowledge of mechanics. Many in this classification graduated in time to the operator division employed on single machines and made good. With the approaching necessity for replacements in the rank of mechanical labor, apprenticeship training has been opened up for this class along with the training of youth.

One result of this extension in training is to increase the shop life of many of the older employees whose services can be utilized, even after retirement age, in the training of the helper class. This training is said to require more than the ordinary amount of patience and perseverance, attributes which are often found in the older workmen.

Some lines of industry—the can manufacturers, for example—that have operated at fairly high rates through the depression years have been able to recruit and train men more effectively than those industries that have had to cut their forces to a skeleton. As skilled labor has been able to choose, it has naturally gone to those lines of industry that have a record of fairly continuous employment.

### More Training at Detroit

In the Detroit district there is no serious shortage of production workers, as various companies have been constantly training them, but at the peak of the die-making program there was a shortage of approximately 500 tool and die makers. Efforts to recruit men from other cities were not very successful.

About 1030 boys attend the city of Detroit's apprenticeship schools and about 1700 are in the Henry Ford Trade School. The Ford plant also has its own apprentice school, a part time arrangement for Ford employees, as well as a 90-day vestibule school for high school graduates who are mechanically inclined. Chrysler has an eight-months' training program to train machine operators on standard production machinery. The 1030 boys in the Detroit apprenticeship schools have all been put in training in the past 10 months as a result of an awakening among Detroit industries of the lack of skilled men.

# Metallurgist's Role in Steel Making Takes on Growing Importance

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ternal structure, are due to the influence of these same minute quantities of extraneous materials.

From this same point of view, the metallurgist has come to perceive that while statically a piece of steel may be a more or less adamant crystalline mass, yet internally it largely functions as a pseudo-colloidal mass within which movements occur with greater or lesser facility because extraneous materials varyingly affect the mobility of movements within the ferrite.

The metallurgist now knows that these theoretical conceptions are paralleled in practical fact and that they connect the heat-treated shaft that hardens deeply or shallowly on quenching, with the tin plate that is under or over annealed after a given cycle of heating, and with the sheet that shows stretcher strains in forming or that does not show them, and with the bar that is shock-resistant or which breaks in a brittle manner, and with the structural angle that is or is not brittle after cold bending.

### His Task a Laborious One

These matters no longer represent unrelated mysteries. The metallurgist knows that his task is simply the laborious and voluminous one of isolating the materials involved, determining their quantitative effects, and establishing control of their occurrence. It is realized in dealing with those small quantities, which are iron oxide, iron nitride, manganese oxide, carbon, phosphorus, and the like, the metallurgist is concerned not only with the total content of such extraneous material present but with the chemical combination and physical form of occurrence. It is of importance to see that as affecting the free-cutting quality of screw steels, sulphur alone may occur as iron sulphide, iron oxy-sulphide, manganese sulphide, and manganese oxy-sulphide, to mention only the more important possibilities, and in view of the variable combinations and percentages possible, it is not to be considered strange that differences in performance result.

And along with considerations of chemical form, the metallurgist has reached definite appreciation of the tremendous importance of physical form of occurrence. He sees clearly that a given material may be in true solution in the ferrite, or may be in finely divided form just beyond the point of solution, or may be coalesced sufficiently to be visible through the microscope. The fact that certain ranges of particle size are critical in nature is appreciated, even though as yet not quantitatively evaluated. This theory would be beyond the knowledge and interest of a car builder who was experiencing breakage in cold shearing heavy flats, but it would be all-important to the metallurgist who would proceed to change the steelmaking practice in ways as yet rather groping but nevertheless adequate to insure that the next and all subsequent shipments would *not* break in shearing.

### Some Methods Have Limitations

The metallurgist's position is further helped by a realization of the limitations of his tools. He is beginning to see that the results from the finest of microscopes may be misleading and therefore actually harmful if such results are taken blindly as the whole story rather than merely as one of a number of measures that must be applied for complete understanding. He is beginning to understand that what he does not see may be vastly more important than what he does see.

Chemical methods have limitations that may restrict thinking. Carbon determinations made with great accuracy still only report the total content present, and give no hint of the volumetric forms of occurrence which are of infinitely greater importance in affecting the performing quality of the steel. The metallurgist understands that while in the case of carbon he can check the chemist against the microscope, yet with many other materials the microscope yields no information and therefore the results reported by the chemist must be regarded as unconfirmed by other sources of information.

So, by subjecting every observation to critical examination, by seeking persistently for the evaluation of every tendency, by concerning himself only with the question of truth or falsity, by persistently and energetically stretching for greater enlightenment, the metallurgist is making rapid and deserved progress.

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# Imports Tending to Overbalance Exports

A COMPARISON of the American balance of trade with various foreign countries, from the pre-depression years to the present, shows a number of significant changes, according to an analysis by the National Industrial Conference Board.

Our merchandise trade with all foreign countries during the period 1926 to 1930 showed an average excess of 18 per cent of exports over imports. In each succeeding year exports exceeded imports, rising to 29 per cent in 1934. The following year the percentage of exports over imports dropped to 12 per cent. In the first six months of 1936 imports exceeded exports by about 1 per cent, but the second half of the present year may show a different relationship between exports and imports.

Exports to the United Kingdom from 1926 to 1930 exceeded imports by 157 per cent, rising in 1932 to 286 per cent. The relative trend of the export balances since 1932 has been downward.

The figures for Canada show a marked decline in the balance of exports over imports. In 1935 exports to Canada exceeded imports from that country by 13 per cent, as compared with 75 per cent during the period 1926 to 1930.

Our merchandise trade with Germany shows a declining relative balance of exports since 1932. The excess of exports over imports in 1935 was 18 per cent in comparison with 82 per cent in 1932, and 90 per cent for the average from 1926 to 1930.

During the five-year period ending in 1930, imports from Japan exceeded American exports to that country by 54 per cent. In 1932 and subsequent years exports exceeded imports. The export balance in 1934 was 77 per cent and in 1935 approximately 33 per cent.

# IMPROVEMENTS IN PRODUCTION

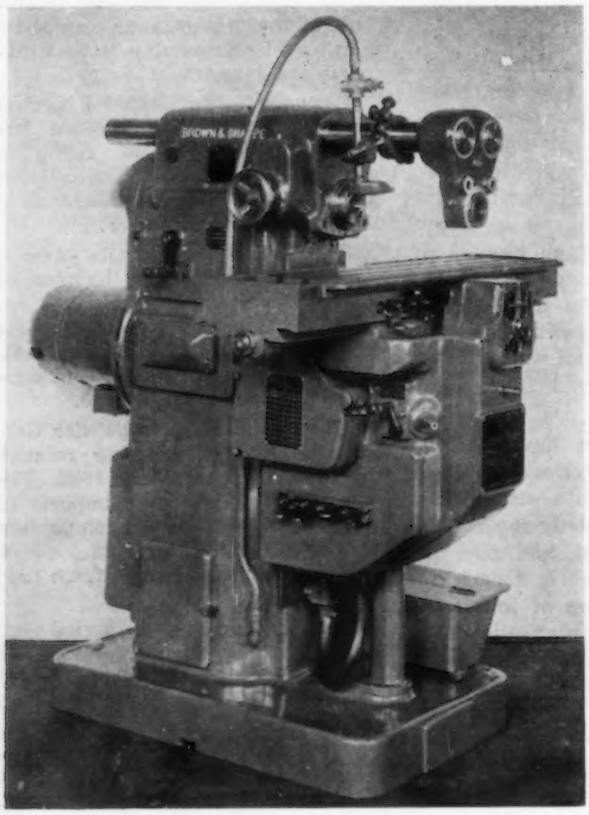
## Electrically Controlled Plain Milling Machine

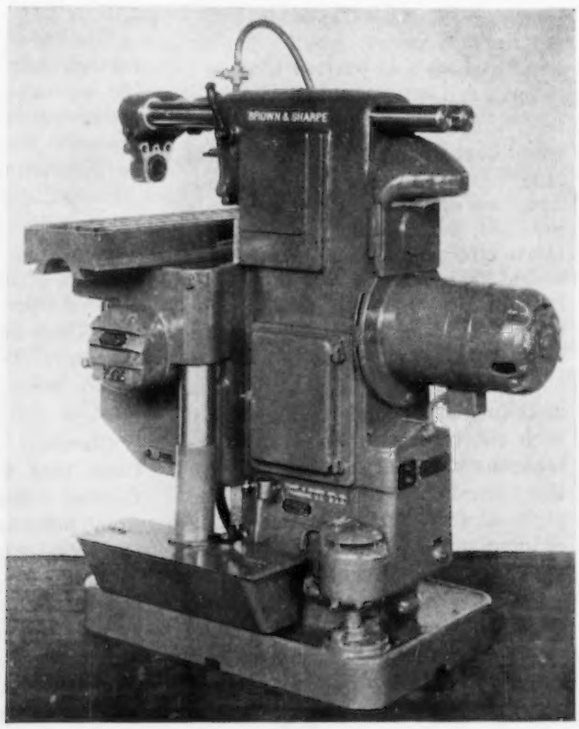
FULL electrical control of all table and spindle power movements features a No. 10 plain milling machine announced by Brown & Sharpe Mfg. Co., Providence, R. I.

The machine is a sturdily-constructed, knee-type production unit designed for the rapid manufacture of small parts on either long or short runs. A wide range of spindle speeds (16 rates, from 55 to 1800 r.p.m.) provides for machining of materials ranging from tough alloy steels to free-cutting brass and aluminum; and a rugged one-piece column and rigidly-braced knee, together with the set-back column face which permits placing the cutters closer to the spindle nose, permits heavy cuts.

Table feed is 12 in., tansverse adjustment of spindle 2 in., and vertical knee adjustment 11½ in. Hand adjustments in all three directions, together with all of the other principal adjustments and operating controls, are within easy reach from the front of the machine.

A wide variety of automatic milling cycles is offered and, the control system gives a very rapid and sensitive tripping action in stopping the table, reversing, and in all other changes in table movement. The spindle, table, and coolant pump are each driven by separate, direct-connected constant speed motors. The table motor (and hence the table itself) is stopped or reversed very quickly by "plugging" (i. e., by reversing the current). The spindle motor is stopped by the same method, and in addition has an integral, electrically-controlled mechanical brake which holds the spindle stationary, to prevent mark-






RAPID production of small parts is through the utilization of full electric control throughout in this new plain milling machine by Brown & Sharpe.

# N AND SHOP EQUIPMENT...

ing the work with rotating cutters, and, to facilitate cutter replacement.

Automatic power movements are governed by adjustable table dogs through a control unit mounted on the front of the knee. Manual control is by push button in the same unit, which also includes a stop button for instant stopping of the table, and a spindle jog button for setting up.

A control switch permits the spindle to stop and start with the table, to rotate only during cutting feed, or to run continuously independent of table movement, as desired. Another switch sets the spindle to rotate in either direction, or to be inoperative. These control switches, together with a safety switch for instantly stopping both table and spindle, are conveniently located on the knee.

The entire table driving mechanism, including the constant-speed motor, is compactly built into the knee, with anti-friction bearings used throughout. In addition to the 16 feed rates (½ in. to 20½ in. per min., obtained through simplified change gearing), the motor provides a fast-travel table movement of 300 in. per min. in either direction whenever desired.

Spindle drive is from a direct-connected, flange type motor mounted on the rear of the column. The 16 speeds available (55 to 1800 r.p.m.) are obtained in two series through simplified change gearing and a series selective lever. The spindle drive is anti-friction mounted throughout, the drive is positive, and there are never more than three points of gear contact between motor and spindle.

Each important bearing surface is lubricated automatically by means of pumps built integral with the spindle and table driving mechanisms.

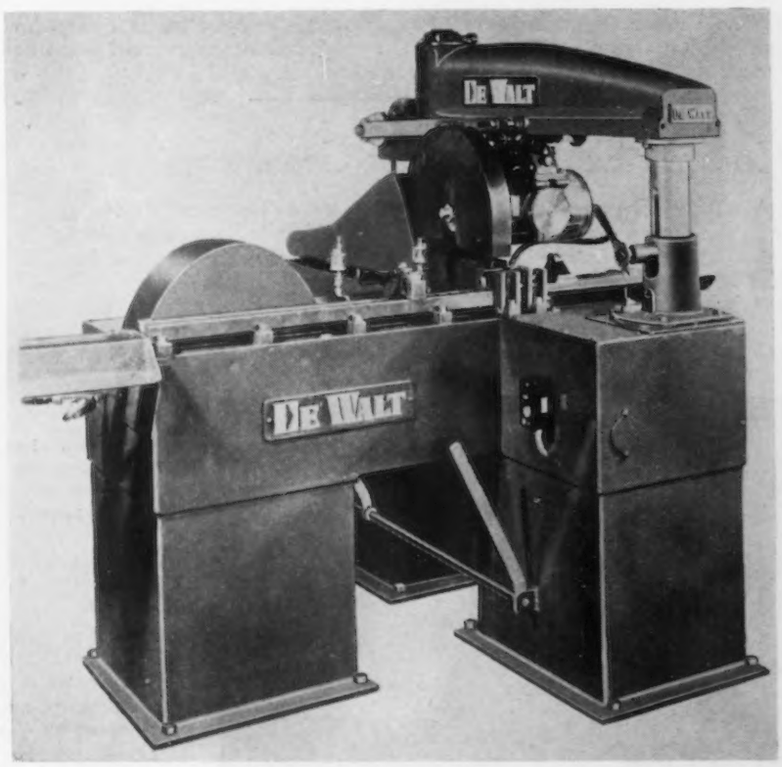
The machine is provided with a built-in coolant system.

## Semi-Automatic Cut-Off Machine with Blade-Unit Travel on Overarm

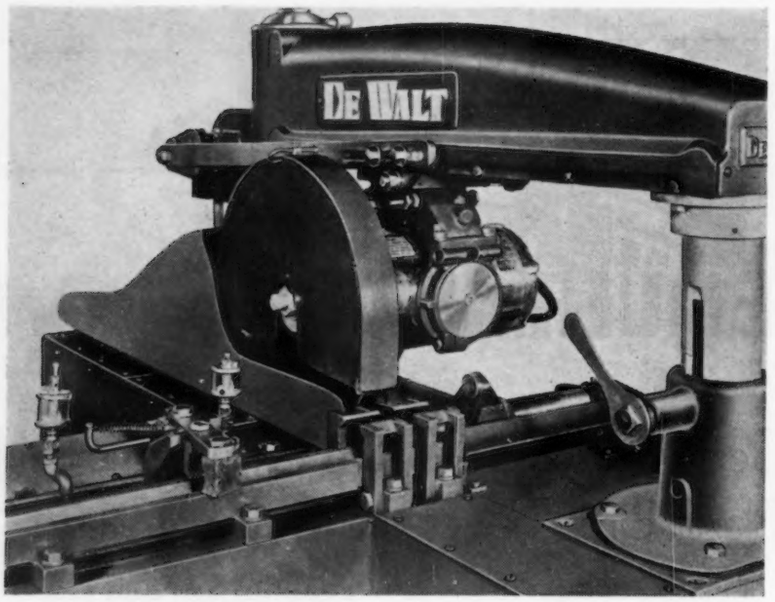
A SEMI-AUTOMATIC cut-off machine for any light-section materials within the capacities of the type blade employed has been brought out by De Walt Products Corp., Lancaster, Pa. In the set-up illustrated, the blade is a 16-in., hollow-ground, metal blade, operating at 3600 r.p.m.

The blade-carrying unit is fed into and backed out of cut along an over-arm. Adjustment is provided for locating the feed-starting position in time-saving relation to the stock to be cut, whether it be, for example, 2-in. light wall tubing, or a relatively wide angle section. A 7½-hp. motor drives the blade.

Material to be cut is automatically fed forward in front of the blade by means of a crank, operating through a cross-head to give straight-line movement. The length of feed is relatively controlled by an adjustable feature within a feed range of 4 to 13 in. An adjustable gage stop provides for accurate length feeding. At the completion of a cut, the stop lifts automatically, during the withdrawing movement of the blade, in providing clearance for automati-




OVERHEAD mounting of the wheel-head unit is an outstanding feature of this cut-off machine. see page 48.




THE wheel-head unit mounting is adjustable in relation to size of stock, a factor which eliminates idle travel.

cally pushing out the cut off work, by means of the next automatic stock-feeding movement. These mechanical feeds are through a variable-speed 1-hp. motor, driving a variable-speed type V-belt pulley, equipped with a slip clutch. Manually loaded, stock-feeding mechanism consists of two hardened clutch jaws, shown angularly open by spring means, and having semi-floating action in maintaining center line of the material with a fixed line of the machine.

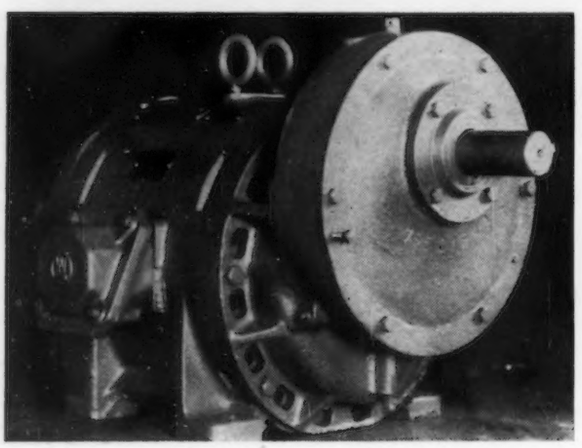
The vise consists of four jaws, two on each side of the material. Of these four jaws, two are always on each side of the blade-kerf travel. Operation is automatic and grip is secured through a toggle mechanism. The jaws are self-equalizing and are equipped with compression springs, in providing against any crushing of very light materials.

Automatic mechanical gripping is at the instant of material contact with gage stop. The feeding and gaging design is said to result in automatic cut-off accuracies to plus or minus 0.005 in. An independent unit for magazine feed is available.

## Compact Explosion-Proof Gearmotors

A NEW line of single reduction explosion-proof gearmotors ranging in size from 1½ to 75 hp. has been announced recently by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. For application in Class 1, Group D hazardous locations where speed reduction is required, these gearmotors have many uses because of their compact design. Gears are of single helical type, heat treated by a special "tough hard" process to provide maximum load-carrying capacity and resistance to wear and shock. Anti-friction bearings maintain correct gear center distances.

The line is approved by the National Board of Fire Underwriters for use in hazardous atmospheres containing gasoline vapors and other gases or vapors having equivalent or less hazard such as petroleum products, ethyl alcohol, methyl alcohol, acetone, and lacquers, solvent vapors, and in dry-cleaning and dry-dyeing plants, pyroxylin plastic manufacturing plants, spray painting establishments, gas plants, varnish manufacturing plants and other applications involving similar hazardous processes.



AT RIGHT

FINAL inspection of an automotive jig by means of the vernier gage.

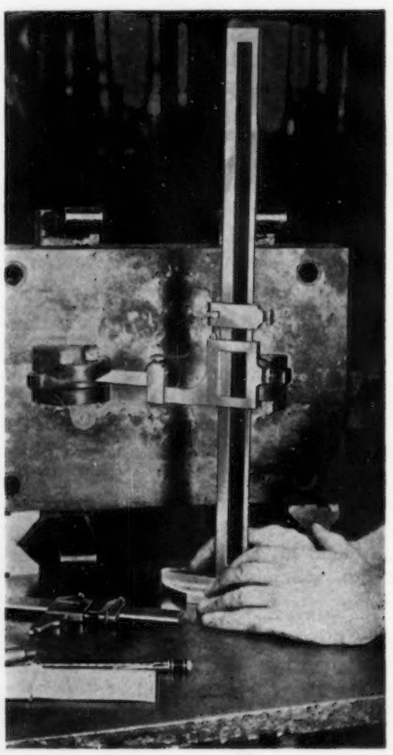
o o o

AT LEFT

A NEW line of explosion-proof gearmotors by Westinghouse covers a range of requirements from 1 to 75 hp.

## Jig Inspection Height Gage

THE inspection set-up illustrated features a new, No. 454, vernier height gage recently announced by



the L. S. Starrett Co., Athol, Mass. The set-up is that of a final inspection of an automotive production jig. The gage may be had in ranges of 18, 24, and 36 in. The bar shown is graduated on one side only to read by means of a vernier to 1/1000 in., from zero to 18 in. The base is recessed in the bottom, hardened, ground and lapped square with the bar, allowing the gage to stand upright. Base dimensions are 5¼ in. long, 2¼ in. wide, and 13/16 in. high. Approximate bar

dimensions are 1¼ in. wide and ¼ in. thick. The bar grooves have a japanned finish.

## New Rotary Surface Grinding Machine

A NEW rotary surface grinding machine announced by the Hanchett Mfg. Co., Big Rapids, Mich., features a one-piece column supporting a vertical motor-driven grinding head and fully inclosing a 30-hp., 900 r.p.m., built-in motor arrangement. The assembled unit is fan ventilated.

Provision is made for down feed of wheel head either automatically or by hand. Power feed employing 2 hp. motor is used for rapid raising and lowering of wheel head and is push button controlled.

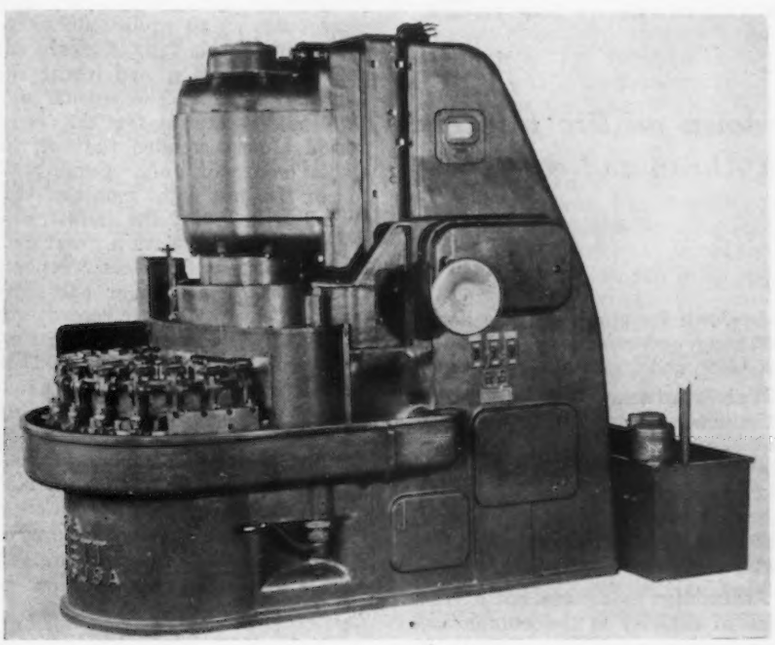
The grinding wheel, 20 in. diameter 3 or 4 in. high and with 2 or 3 in. wheel face, may be of either cylinder or of segmental type. Work table is 36 in. diameter and has an infinite number of speeds ranging from ½ to 1½ r.p.m., the drive being through Transitorq variable speed unit mounted at the rear and connected to 2 hp. motor. The table may be in the form of a 36-in. rotary magnetic chuck if desired.

A built-in wheel dresser is lever operated at the right side of machine close to the operator's position. An automatic sizing device compensates for wheel wear.

The coolant system comprises a Ruthman motor driven centrifugal pump mounted in an auxiliary tank having a capacity of 150 gal. Coolant is introduced to the grinding wheel and work at the center of the wheel and auxiliary nozzles flow onto the work from the outside of the wheel.

All electrical controls are located within the column and built into the machine proper.

Weight of the illustrated unit is 17,000 lb.



A 36-IN. work table with infinite number of speeds provides flexibility in multiple surface grinding.

## Hydraulic Shaper Features Flexibility

THE circular work-piece shown involves an internal gear having 90-in. pitch circle, 2-in. face and 4-pitch teeth. The set-up is on a hydraulic shaper manufactured by the Rockford Machine Tool Co., Rockford, Ill. Gear teeth are cut from solid tough steel in three stages—gashing, forming and finishing. Finish specifications are very rigid and relatively small quantities are run.

The work-piece is mounted on the arbor of an accurate indexing device. The indexing head and the machine are mounted in accurate relationship on a heavy base. The machine is standard throughout, and requires no special preparation other than mounting, and when not employed on this job is available for a regular run of shaper work.

The ram drive, without gears or other mechanical elements, provides for freedom from marks on machined surfaces, while high-return ratio, quick shock-free reversals, and uniform cutting speed throughout the stroke combine to give rapid production. Length of stroke is established through the manual adjustment of two dogs and is sufficiently accurate to allow the stroke to run out, on this particular job, in a very narrow groove at the end of the stroke.

# THIS WEEK ON THE ASSEMBLY LINE

***. . . Total assemblies reach new low as Ford production falters before final completion of 1936 run, although 12 companies are now in production on 1937 models.***

o o o

***. . . September sales of Packard and Studebaker indicate brisk fall demand for new models.***

o o o

***. . . Car builders anticipating requirements by making commitments for steel further ahead than usual because of delivery situation at the mills.***

o o o

***. . . Goodrich company showdown on tire workers clarifies labor situation in Akron and eases fear of tire shortage,***

DETROIT, Sept. 29.—Although Cadillac, Hudson, Plymouth and Dodge have been added to the list of companies now producing 1937 models, production for the week ended Sept. 26 dropped to a new low because of sporadic activity at the Ford Motor Co. It was reported the week before that Ford had cut off 1936 production beginning Wednesday, Sept. 16, but operations were resumed the following week on a limited scale, principally commercial assemblies, and will be continued until today (Sept. 29). Ford is then expected to be down for three working days, resuming operations on Oct. 5 on the 1937 model runs.

Ward's Automotive Reports, Inc., estimates total output of passenger cars and trucks in the United States and Canada at 20,597 for last week, as compared with 26,640 the week before and approximately 16,740 in the corresponding week last year.

Assemblies today are not a true gage of activity in the automotive industry, since large banks of parts are being built up in preparation for getting the assembly lines into full swing in the very near future. It is fairly evident that announcements will be scattered from the beginning to the end of October and that practically no models will remain undisclosed up until the opening of the Auto Show in New York. Right now the plants are in a seething turmoil of activity in getting the lines changed over, the chief deterring factor being the late delivery of some machine tools and the time necessary to work out the "bugs" on new production lines.

### Sales Break Records

Sales records of Packard and Studebaker, both of which announced in early September, give some clues as to what automotive sales will be this fall. Packard set an all-time sales record during the first 20 days of the month and Studebaker's sales for the same period almost equaled that of the whole month of July. Coming on top of the best eight months' sales period since 1929, the industry is facing the future with a great deal of optimism. Chevrolet reports that sales of passenger cars and trucks have broken all records for any similar period in the history of the company. Deliveries of 1936 models at retail through August totaled 1,045,440 units, exceeding the record of the same period in 1929 by 116,760 units. Pontiac also reports the completion of the best eight months of any year since 1929. Hudson reports a gain of 54 per cent over shipments of 1935 models and the greatest shipment of any season model since 1929.

Total automobile sales throughout the nation for August exceeded the 1935 figure by 12½ per cent,

according to reports of R. L. Polk & Co., although the August figure was 26½ per cent below the July, 1936, figure. For the eight months' period, sales of new passenger cars in the United States exceeded the same period in 1925 by 24.9 per cent. Increases in truck sales were almost exactly comparable. Truck sales in August, however, were very close to the July figure, falling short by only 7 per cent.

Factory sales of cars and trucks in the United States, together with Canadian production, came to 275,951 units during August, Department of Commerce figures indicate. This is approximately 9 per cent over the comparative total of 245,075 units in August, 1935. Preliminary estimates on September production are approximately 115,000 units, which should represent the low point for the year.

### Steel Commitments

Because practically all of the automobile companies are now in production on 1937 models, commitments for steel are rather heavy at the present time and are coming in from all available sources. Releases against old orders are also in good volume and the automobile companies are accepting steel today as fast as they can get it. Many of them are building up substantial stocks of steel, so that they will not be embarrassed by any possible delays in shipments at later dates. It is quite evident, however, that these stocks will be depleted very rapidly when the assembly lines get going. Hence, orders are being placed at the present time for early December delivery. In fact, in all lines it is evident that buyers are trying to anticipate their requirements as far ahead as possible in order to have material on hand when needed.

### Rubber Troubles

Labor relations in the rubber industry have been the only thorn in the side of the automotive manufacturers during the past year. With "sit-down" strikes reaching epidemic proportions at the Goodyear Tire & Rubber Co., it looked as if the lid might blow off at any moment, resulting in a complete tie-up of the Akron tire plants. To defeat such a purpose, the tire builders have been operating their plants at full capacity and have been piling up inventories so as to be in a position to serve the automobile industry for several months should a complete shutdown occur. The strength of their position was clearly indicated last week when, on Sept. 23, the B. F. Goodrich Co. closed its plant and locked out nearly 15,000 employees because of a sit-down strike affecting 2000 workers. The company let it be known that it was well stocked with tires and expected to keep the factory closed until the union outlawed wildcat strikes. The union took the company at its word and decided that this was no bluff, for on the third day an agreement was reached and the workers returned to their jobs on Saturday morning under the status prevailing before they left the plant. This does not mean, however, that the United Rubber Workers have given up the idea of making Akron a closed shop town. The next move is to arrange for an election, if possible, to prove that they shall be the sole bargaining agency in these plants.

Incidentally, the week before in Akron the annual meeting of the U. R. W. had condemned unauthorized or wildcat sit-downs as being in violation of the policy and purpose of the Committee for Industrial Organization, which is backing this group.

Much pressure has come from the automobile manufacturers for the tire builders to decentralize their production. Several months ago Goodyear bought the old Hupp engineering building in Detroit, but has used it principally for storage of tires, of which there is said to be a large stock on hand, and also for storage of machinery, "just in case," although there are yet no signs of manufacturing activity there. A few weeks ago Goodyear purchased the old National Acme Co. plant at Windsor, Vt., which has been vacant since 1933. It is understood that this plant will be used by Goodyear for tire production and is seen as a definite move toward decentralization of production activities. Goodyear has also considerably strengthened its production at its Gasden, Ala., plant, although its Akron workers celebrated the event with a series of sit-down strikes.

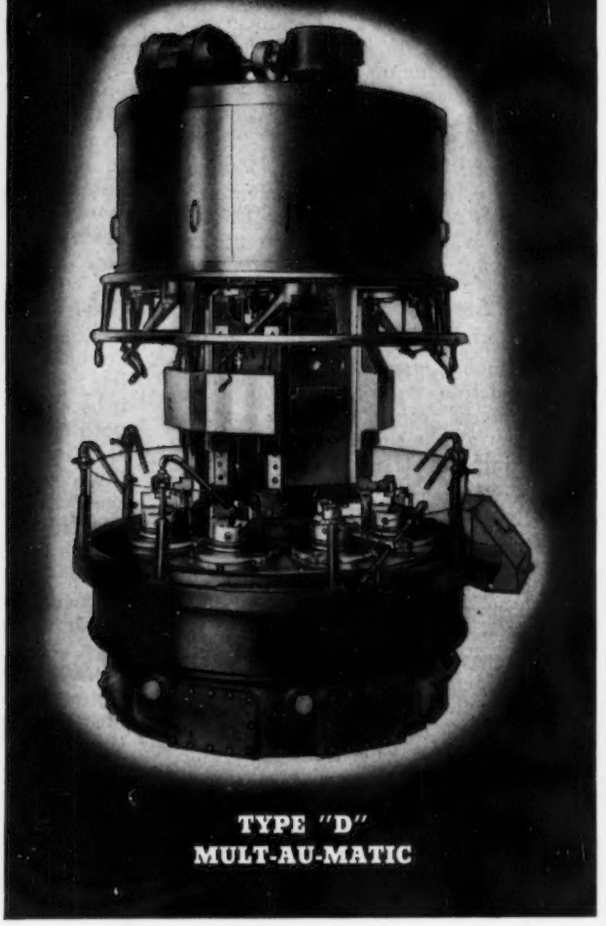
### Akron a Labor Hotbed

Akron has acquired such a bad reputation in the past few months for its labor relations that the Goodyear company has recently prepared some statistics to indicate that wages in the rubber tire industry lead all other mass production lines, including automobiles, which most people consider as tops from the point of view of hourly rates. In a recent bulletin from the company, it is indicated that the present average hourly wage for all Goodyear workers is

# THE REFLECTIVE MIND

*Reviews Facts*

IN THE LIGHT OF PRESENT AND FUTURE NEEDS



TYPE "D"
MULT-AU-MATIC

OBSERVATION of illustrated facts and Attentive hearing of presented evidence provide the Reflective mind with information for Accurately analyzing and comparing manufacturing equipment.

The Reflective Mind selects equipment not alone on reputed Performance, but more especially on "What can it do for me?" Quality production with the Greatest Saving of manufacturing Costs is the answer.

Bullard Engineers are at your service to survey your jobs and suggest the Best Method for Reducing costs on Boring, Turning, Drilling, Reaming, Threading, and other operations.

Ask Bullard Engineers to submit Facts for your Reflection, Analysis, and Comparison.

## THE BULLARD COMPANY

BRIDGEPORT CONNECTICUT

99.6c. an hour, not including any salaried persons. An interesting comparison is drawn from the point of view of a tire worker as a consumer of his product. In 1908, for example, the worker in the tire industry received about 40c. an hour for his labor. If he bought a tire, he had to pay $35 for it and could not expect more than 2000 miles of service. Stated otherwise, his hour of labor would have yielded him 23 miles of tire travel. In 1936, on the other hand, a workman of similar skill in the tire industry received an average wage of about 88c. Thanks to improved production methods and greater labor efficiency, he now has to pay only $8 for his tire and he could expect it to last for 20,000 miles. His hour of labor today would buy him 2200 miles of tire travel—95 times as much as it did in 1908.

In the meantime, an awakened consciousness on the part of the city of Akron to save its principal industry and livelihood will undoubtedly do much to bring the United Rubber Workers into line. Incidentally, although this group has made several assaults upon the Detroit tire plant of United States Rubber Products, Inc., they have made no headway at all, owing to an excellent program of industrial relations and one of the smoothest-working works council plans in the country, largely due to the personality of the man directly in charge of this work.

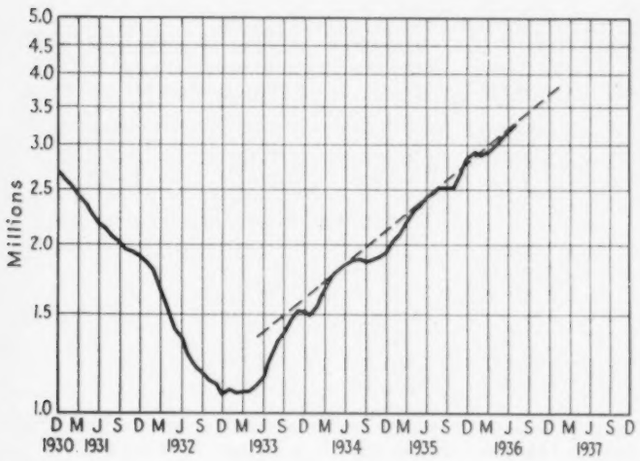
## Detroit for Open Shop

The drive of the United Automobile Workers' Union launched in Detroit in July has not made much progress during the summer. For a brief interval attempts were made to drum up interest among workers in the jobbing tool and die shops, but this field of concentration has largely been abandoned, since the die program will be over within a few weeks. Besides, the scarcity of skilled workers and the competition betweeen shops for available men have done more to improve wages than any possible union effort could have done over a period of a good many years. Attention was then shifted to tool and cutter shops, but no success has been reported in this field as yet. As matters stand now, practically all effort is being directed toward educating the workers regarding the union movement through a series of mass meetings being scheduled at various high schools throughout the city during coming weeks.

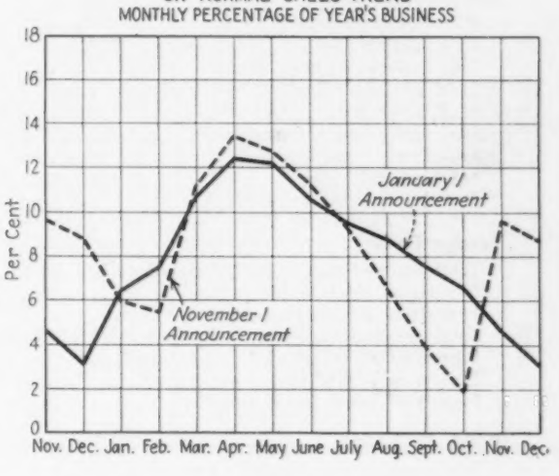
It is going to be a long, slow drive for union workers to get anywhere in Detroit and they seem to recognize the difficulties with which they are faced; hence they are planning a long, slow campaign. Detroit is perhaps the most open-shop minded community in the country. For example, in a recent issue of *The Detroiter*, published by the Board of Commerce, a front cover editorial openly called upon business men "to continue to safeguard their workmen and protect Detroit's interests by choosing open shop contractors and suppliers."

The horrible example of Seattle is held up to the community, where political powers-that-be are definitely on the side of organized labor. Detroit is not in a similar position on union domination due solely, it is said, to the fact that its industrial pioneers decree that business should be operated under the "American Plan" of employment. The open shop is very definitely Detroit's rule. This stand of the Board of Commerce is unique and is perhaps without a parallel in any other large American city.

MOVING 12-MONTH AVERAGE OF U.S. PASSENGER CAR DELIVERIES




EFFECT OF NOV. 1 ANNOUNCEMENT ON "NORMAL" SALES TREND
MONTHLY PERCENTAGE OF YEAR'S BUSINESS




**THESE charts were shown by C. E. Wilson, vice-president of General Motors Corp., before the Association of Iron and Steel Engineers convention in Detroit on Sept. 22. Chart at the left shows by a 12-month moving average that there has been a steady monthly improvement of 2¾ per cent during the past three years since the bottom of the depression was reached. Mr. Wilson sees no indication that the rate of improvement in the industry has been halted and predicts a good volume of business ahead.**

**The chart at the right shows what Nov. 1 announcements have done to the normal monthly sales curve of the corporation's products. Shifting the date forward two months gave improved business for November and December and permitted field stocks to be built up in January and February so that the corporation was in a better position to take care of the big demand in the spring. The seasonal shutdown also comes at a better time as far as the workers are concerned.**

**Other charts not now available show that when the national income was 40 billion dollars, approximately 2.4 per cent was spent for automobiles, and when it was 80 billion, 4.1 per cent was spent for new cars. Furthermore, whereas prior to 1933 the ratio of increased automobile business to increased national income was 35 per cent for each 10 billion increase in national income, during 1933-34-35 a similar increase in automobile business is indicated for each 5 billion dollar increase in national income. Mr. Wilson attributes this increase in the purchase of automobiles to the greater values of the cars since the depression—the familiar story of an improved product for less money.**

# Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

| | August, 1936 | July, 1936 | August, 1935 | Eight Months, 1935 | Eight Months, 1936 |
|---|---|---|---|---|---|
| **Raw Materials:** | | | | | |
| Lake ore consumption (gross tons)[a] | 3,968,845 | 3,826,050 | 2,615,927 | 19,170,108 | 27,407,391 |
| Coke production (net tons)[b] | 3,993,602 | 3,828,548 | 2,833,707 | 22,468,866 | 29,117,450 |
| **Pig Iron:** | | | | | |
| Pig iron output—monthly (gross tons)[c] | 2,711,721 | 2,594,268 | 1,761,286 | 13,080,549 | 18,834,215 |
| Pig iron output—daily (gross tons)[c] | 87,475 | 83,686 | 56,816 | 53,829 | 75,944 |
| **Castings:** | | | | | |
| Malleable castings—production (net tons)[d] | ..... | 44,413 | 35,245 | 296,057 | ..... |
| Malleable castings—orders (net tons)[d] | ..... | 41,031 | 35,602 | 281,356 | ..... |
| Steel castings—production (net tons)[d] | ..... | 78,654 | 34,972 | 247,022 | ..... |
| Steel castings—orders (net tons)[d] | ..... | 74,001 | 45,426 | 262,366 | ..... |
| **Steel Ingots:** | | | | | |
| Steel ingot production—monthly (gross tons)[e] | 4,195,130 | 3,922,731 | 2,915,930 | 21,226,408 | 29,444,196 |
| Steel ingot production—daily (gross tons)[e] | 161,351 | 150,874 | 107,997 | 102,543 | 141,559 |
| Steel ingot production—per cent of capacity[e] | 73.52 | 68.74 | 48.78 | 46.31 | 64.5 |
| **Finished Steel:** | | | | | |
| Trackwork shipments (net tons)[e] | 6,401 | 6,216* | 4,028 | 29,657 | 47,209 |
| Steel rail orders (gross tons)[e] | 5,800 | 56,880 | 9,400 | 317,157 | 659,028 |
| Sheet steel sales (net tons)[f] | 207,781 | 192,873 | 207,140 | 1,558,438 | 1,608,740 |
| Sheet steel production (net tons)[f] | 202,456 | 217,651 | 206,613 | 1,578,011 | 1,694,765 |
| Fabricated shape orders (net tons)[g] | 95,390 | 188,053 | 102,859 | 687,806 | 1,034,114 |
| Fabricated shape shipments (net tons)[g] | 127,106 | 147,824 | 122,749 | 728,145 | 952,344 |
| Fabricated plate orders (net tons)[d] | 28,319 | 60,324 | 23,628 | 141,980 | 318,125 |
| Reinforcing bar awards (net tons)[e] | 33,770 | 45,245 | 13,590 | 136,140 | 255,610 |
| U. S. Steel Corpn. shipments (tons)[h] | 923,707 | 950,851 | 624,497 | 4,726,290 | 6,905,904 |
| Ohio River steel shipments (net tons)[i] | 113,560 | 110,495 | 92,501 | 578,613 | 689,676 |
| **Fabricated Products:** | | | | | |
| Automobile production, U. S. and Canada[k] | 275,951 | 451,474 | 247,686 | 2,970,913 | 3,322,249 |
| Construction contracts, 37 Eastern States[l] | ..... | $294,833,800 | $168,557,200 | $1,024,423,000 | ..... |
| Steel barrel shipments (number)[d] | 588,660 | 752,223 | 600,993 | 4,189,606 | 5,186,644 |
| Steel furniture shipments (dollars)[d] | ..... | 1,510,716 | 1,327,252 | 9,450,546 | ..... |
| Steel boiler orders (sq. ft.)[d] | 1,074,597 | 1,109,849 | 543,975 | 3,736,620 | 6,846,063 |
| Locomotive orders (number)[m] | 3 | 9 | 0 | 21 | 134 |
| Freight car orders (number)[m] | 3,225 | 4,469 | 100 | 7,183 | 34,248 |
| Machine tool index[n] | 127.5 | 150.1 | 125.8 | †112.2 | †135.5 |
| Foundry equipment index[o] | 145.4 | 159.6 | 113.0 | †102.4 | †148.8 |
| **Foreign Trade:** | | | | | |
| Total iron and steel imports (gross tons)[p] | ..... | 47,940 | 31,312 | 246,097 | ..... |
| Imports of pig iron (gross tons)[p] | ..... | 12,496 | 8,568 | 67,573 | ..... |
| Imports of all rolled steel (gross tons)[p] | ..... | 19,638 | 17,657 | 129,348 | ..... |
| Total iron and steel exports (gross tons)[p] | ..... | 296,738 | 247,312 | 2,140,048 | ..... |
| Exports of all rolled steel (gross tons)[p] | ..... | 93,365 | 82,866 | 577,704 | ..... |
| Exports of finished steel (gross tons)[p] | ..... | 83,599 | 64,400 | 497,988 | ..... |
| Exports of scrap (gross tons)[p] | ..... | 192,817 | 156,658 | 1,481,132 | ..... |
| **British Production:** | | | | | |
| British pig iron production (gross tons)[r] | 635,800 | 661,100 | 543,400 | 4,263,700 | 5,046,000 |
| British steel ingot production (gross tons)[r] | 872,700 | 974,100 | 759,900 | 6,364,400 | 7,591,000 |
| **Non-Ferrous Metals:** | | | | | |
| Lead production (net tons)[s] | 33,542 | 39,576 | 34,856 | 261,759 | 297,133 |
| Lead shipments (net tons)[s] | 46,388 | 38,996 | 38,195 | 268,202 | 299,861 |
| Zinc production (net tons)[t] | 43,614 | 45,553 | 35,547 | 280,543 | 352,899 |
| Zinc shipments (net tons)[t] | 46,085 | 41,891 | 38,824 | 286,102 | 340,463 |
| Deliveries of tin (gross tons)[v] | 5,385 | 7,120 | 5,320 | 39,000 | 49,525 |

†Three months' average. *Revised.

Source of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corp.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; [l] F. W. Dodge Corp.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.

Weekly Index of Rate Activity in Capital Goods, Adjusted for Seasonal Variation, 1925-27 Average = 100

### THE IRON AGE Weekly Index Numbers of Capital Goods Activity

(1925-27 = 100)

| | | | |
|---|---|---|---|
| Last week | 77.6 | Same week 1933 | 48.9 |
| Preceding week | 87.7 | Same week 1932 | 33.5 |
| Same week last month | 87.2 | Same week 1931 | 53.1 |
| Same week 1935 | 52.8 | Same week 1930 | 78.3 |
| Same week 1934 | 43.6 | Same week 1929 | 115.4 |

A SHARP recession in THE IRON AGE's weekly barometer of capital goods activity has established the index at its lowest level in 15 consecutive weeks. The seasonally adjusted curve of industrial business operations dropped last week to 77.6 per cent of the 1925-27 average. The week before it had risen to 87.7, apparently on the upgrade since for approximately a month there had been no set-backs.

The abrupt change which occurred last week came about despite increases in two of the capital goods index's components, the steel ingot and heavy construction series. Two others, the lumber shipments index and the Pittsburgh industrial factor, declined moderately, but fundamentally the heavy loss in the combined level of activity was due to the automobile component. This factor showed after seasonal adjustment last week a decline from its preceding level of approximately 50 per cent. The reason is that makers' assembly lines slowed to a minimum of production as the nadir in model change-overs was reached. On a seasonal basis, the low point in output came later than expected and was not fully compensated for by the seasonal corrective factors. Transmitted to the general industrial index, its influence was excessive.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Cram's Reports, Inc.; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.

## Survey Shows Trend Of Depression Wages

AT no time during the business depression did the average hourly earnings expressed in terms of purchasing power of wage earners in manufacturing industry fall below the 1929 level, according to a study, "Wages, Hours, and Employment in the United States, 1914-1936," published by the National Industrial Conference Board. As a result of a greater drop in the cost of living than in hourly wage rates, "real" hourly earnings, as they are called, tended to move upward during the period from December, 1929, to January, 1932. The subsequent trend was downward, but before the 1929 level was reached an upward movement, starting in August, 1933, brought "real" hourly earnings in the spring of 1934 to a point approximately 25 per cent above the average for 1929, where they have since tended to remain.

With respect to "real" weekly earnings in manufacturing, the Conference Board's study shows that, primarily as a result of the drop in average hours of work from 48.3 in 1929 to 31.9 in July, 1932, the purchasing power represented by the contents of the average wage earner's weekly pay envelope was diminished by approximately 30.5 per cent. Subsequently, an increase in average hours coupled with a rise in wage rates contributed to restore "real" weekly earnings to the 1929 level in the second quarter of 1936.

# WASHINGTON. . . . . .

o o o

By L. W. MOFFETT
*Resident Washington Editor, The Iron Age*

o o o

***. . . Tax revision to be sought at next session of Congress if Roosevelt is reelected, but major levies probably will not be disturbed.***

o o o

***. . . Representative Patman threatens to amend price discrimination bill to prohibit retailers from doing any manufacturing.***

o o o

***. . . Shipbuilding program under new Merchant Marine Act provides for 6,527,000 gross tons of vessels to be built in six years.***

WASHINGTON, Sept. 29.—Studies looking to tax revision at the next session of Congress have been begun. . . . They are the outgrowth of a recent White House conference President Roosevelt held with Senator Harrison, chairman of the Committee on Finance, and Representative Doughton, chairman of the Committee on Ways and Means. . . . Following the conference, the President announced that tax revision will be undertaken . . . if he is reelected. . . . The general view is that the move was made as a gesture to business . . . at that, however, it offered no satisfactory consolation . . . for the best assurance given was that there would be no increase in taxes . . . and even this assurance appeared to be qualified . . . which is perhaps just as well . . . since there is serious doubt that further increases in taxes can be avoided . . . because the tremendous drain on the Treasury continues unabated with outpouring of dollars exceeding income by about two to one, despite the much touted increase in income based on improvement in business. . . . Funds to farmers have taken an upward surge, which should agreeably remind them that election is near at hand; relief rolls, badly in need of purging, are swinging higher, and unemployment remains at a discouragingly high level, estimated to range at 9,000,000 to 10,000,000, to say nothing of the enormous surplus of those on the payroll in the different Government branches, chiefly in the alphabetical soup agencies . . . and as the Social Security Board gets under way its personnel will have to be increased to operate its huge program governing payroll taxes, and old age pensions, to become effective Jan. 1, 1937 . . . and calling for heavy and continuing costs, for the Federal Treasury, private industry and employees. . . .

In view of this situation it is natural that there is deep-seated skepticism that anything in the way of tax relief of substantial character will be accomplished . . . on the contrary concern is felt lest taxes be boosted once more. . . . It is the ostensible purpose to revise the revenue acts of 1934 and 1935 . . . at least one source of satisfaction is that the studies are under the able direction of L. H. Parker, Congressional tax adviser, and that in gathering material from the Treasury Department he will receive valuable aid from experts . . . unfortunately, however, it is often the case that advantage is not taken of such material and advice by those who have power to act . . . that's the political fly in the ointment. . . .

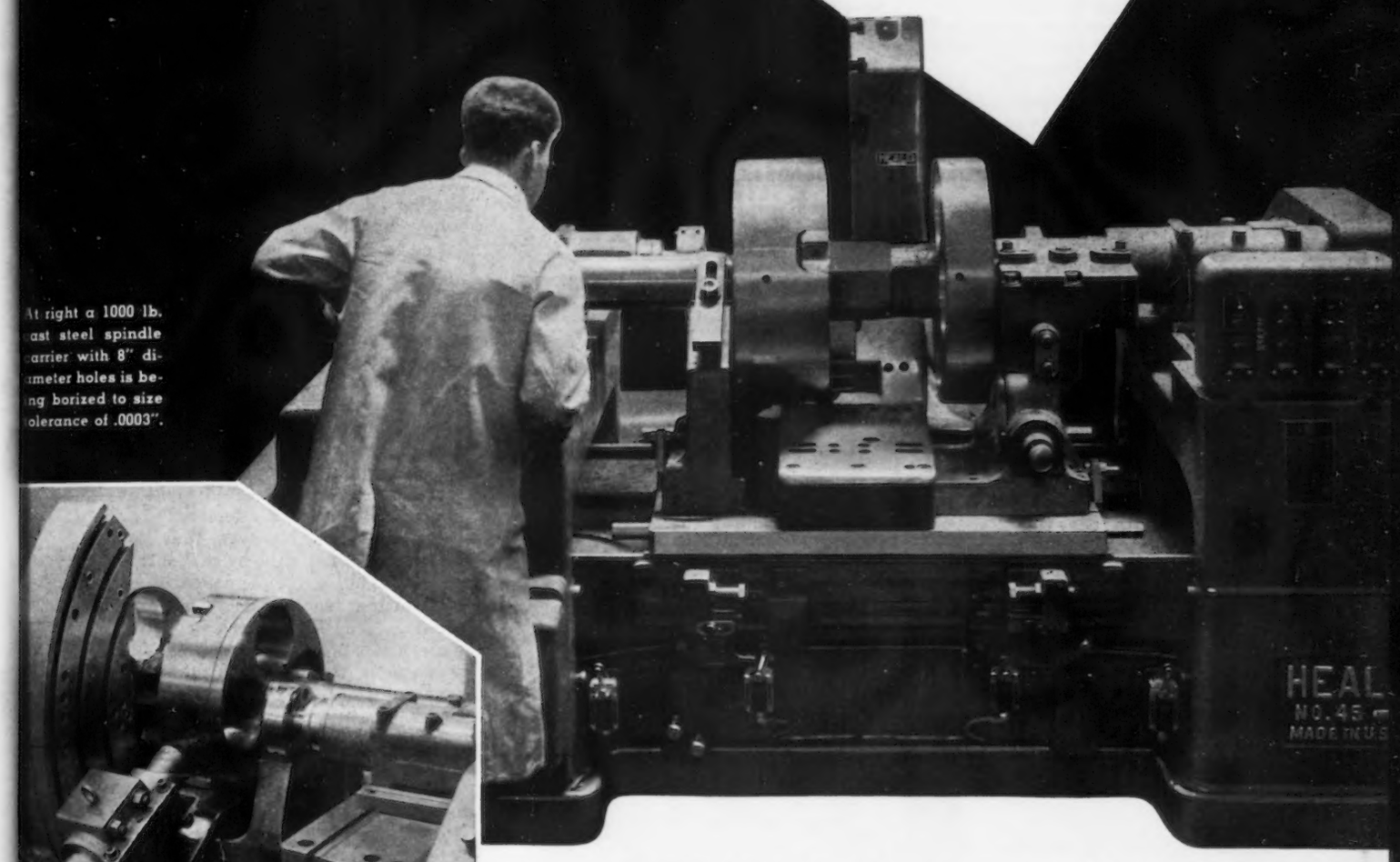
### Corporation Tax to Remain

Moreover, no general overhauling of the income tax law is contemplated . . . and also highly important is the fact that other than some sort of a check, nothing will be done with regard to the 1936 tax law with its heavy assessment on corporation surpluses . . . legislation that was vigorously assailed by industrial and other interests . . . and was strongly opposed even by prominent New Deal supporters . . . a law that does not become fully effective until next year. . . . The effect of the 1935 "soak-the-rich" law will not be known until returns are received for the present calendar year . . . it imposed higher surtaxes, kited to 31 per cent on incomes between $50,000 and $56,000 and to 75 per cent on incomes in excess of $5,000,000 . . . and provided graduated corporation levies . . . already it is predicted that returns from this law will fall much below estimates made when the tax was proposed. . . . The 1934 tax law reduced Federal taxes on small wage earners and increased taxes on higher incomes, especially those received from dividend payments. . . .

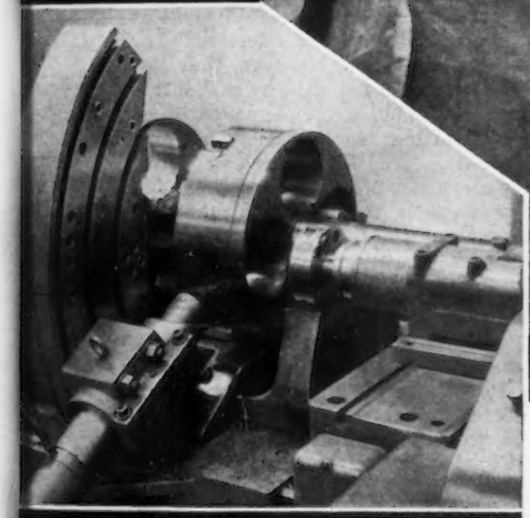
The best guess at this time is that, assuming taxes actually are not increased, the only thing that will result from the so-called tax revision program will be the elimination of certain nuisance taxes

# NATIONAL ACME SPINDLE CARRIERS

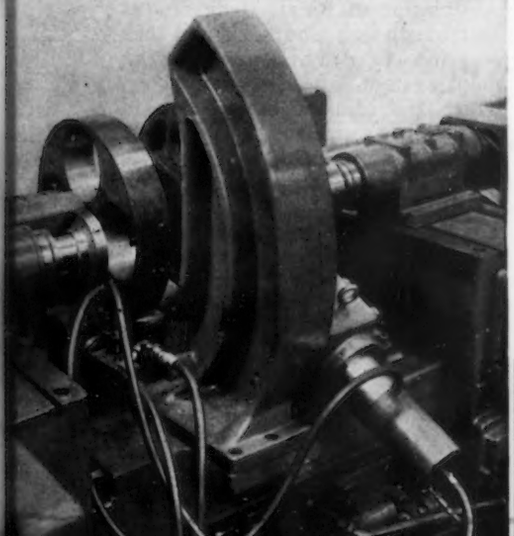
## *Borized to Ultra-Precision*
## *on*
## HEALD No. 45
## *Bore-Matic*




At right a 1000 lb. cast steel spindle carrier with 8" diameter holes is being borized to size tolerance of .0003".



Above. Indexing arrangement. Boring hole and facing shoulder, rear end.
Below. Borizing front holes in spindle carrier.



Determined to produce the most accurate product possible, the National Acme Company of Cleveland have installed a Heald No. 45 Bore-Matic for borizing the bores in their spindle carriers.

This machine is particularly well suited for this work, handling many types of carriers, some of which weigh approximately 1000 lbs. Material is cast steel.

The number of holes bored varies with the type of carrier. The photographs show a 4-spindle type in which four holes are bored at one end of the machine and another set of four holes is bored and faced concentrically with the first set at the other end. The holes are 8" in diameter and are held to a size tolerance of .0003". The holes are spaced within a tolerance of .0005" with the accumulated tolerance not exceeding .0005".

This same No. 45 Bore-Matic is being used for finish boring all styles and sizes of cylinder blocks for various motor manufacturers; both in America and overseas.

THE *Heald* MACHINE CO. – WORCESTER, MASS.

# LOOK to the Wood!

*We have an interesting booklet on Durock and Silveroc hammer boards which we'll gladly send to anyone who is interested.*

Idle drop hammer time is frequently caused by failure of the board to stand up. Look to the boards you are now using and see if they compare with "Durock" or "Silveroc."

Preferred by hammer-men in many production forge shops, these Durock and Silveroc hammer boards stand up longer under the severe shocks imposed on them.

"Durock" is a tough, pliable, straight-grained Pennsylvania Rock Maple thoroughly seasoned and scientifically cut. "Silveroc" is treated for extra service. Increase your productive hammer time with "Durock" or "Silveroc."

**H.G. IRWIN LUMBER CO.**
**ERIE, PA.**
**DUROCK**


. . . and probably not important taxes at that . . . that the country is hearing the boom of a howitzer and will see the effects of a popgun. . . .

In short the tax situation, in keeping with the times, is in a muddle . . . and promises of "breathing spells" for business, heretofore going into the discard, still are held lightly. . . . In view of the political campaign they are subject to even heavier discount than previously . . . if that is possible. . . .

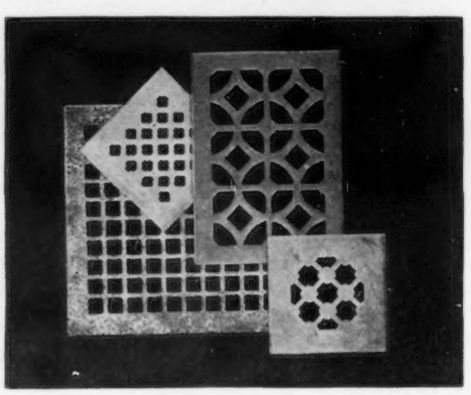
Among the numerous muddles that is gaining increased attention is the hodge-podge known as the Robinson-Patman price discrimination act. . . . Its chief legislative sponsor, Representative Patman of Texas, apparently is concerned lest it will be a flop and that instead of helping the "little fellow," for whom he has affected so much solicitude, it will hurt him . . . and many of these "little fellows" share the same view and at the outset had no desire for the legislation . . . fearing with justification that its supposed principles—equality of treatment, based on actual costs, between the small and large business enterprises . . . would be destroyed by conflicting, contradictory legislative complexities. . . .

So Mr. Patman has made public a proposed bill which would prevent manufacturers from engaging in retail distribution! . . . Evidently believing that the Robinson-Patman act already had developed a trend toward combination of producing and distributing units to the further detriment of the "little fellow," who is without resources to effect such a vertical type of business . . . though many legal authorities say the proposed bill would be held unconstitutional, just as they claim many provisions of the Robinson-Patman act are unconstitutional, Representative Patman in a letter says with assurance: "I have such a bill prepared and am convinced that it will be constitutional as to all interstate transactions, which would make it almost 100 per cent effective." . . . It will be noted, however, that Mr. Patman has not said he will introduce the bill. . . . Apparently he is awaiting reaction as to his proposal . . . as the American Retail Federation pointedly observes: "It is possible that Mr. Patman has sent out this letter as a trial balloon." . . .

### Revives Basing Point Issue

While the Federal Trade Commission, in charge of administration of the Robinson-Patman act, refrains from giving advance interpretations of the law, Chairman Charles H. March of the commission has given about as clear an analysis of the act as has been made. . . . He did so in an address on "Monopoly and the Robinson-Patman Act" before the National Association of Retail Druggists at Pittsburgh last Thursday and took occasion to drag in the basing point system in the steel industry, which the commission delights in attacking as promoting monopoly. Without attempting to draw inferences, the commissioner's remarks are held to be significant as possible use of the act again to attack the basing point system. . . . Leastwise the basing point-phobia of the FTC found expression in the statement of Mr. March as he


# Grilles



Heavy modern equipment provides for fabricating steel or bronze into grills as heavy as 5/16 inch thickness in flat, curved shapes, standard and special designs. Our Electro-plating plant can match any special finish.

WICKWIRE SPENCER STEEL COMPANY
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BUFFALO WORCESTER CHICAGO SAN FRANCISCO

**WICKWIRE SPENCER perforated metals**

*Grill Catalog "Clinton Grills" and perforated metal folder "Wissco Decorative Perforated Metals" will be gladly sent upon request.*

harped on monopoly which by some quaint process of reasoning the commission maintains is promoted by use of the system . . . he took a crack at the Supreme Court doctrine, as he called it, of "good trusts," which he said was but a development of the so-called "rule of reason" where the Supreme Court held that not "every" combination in restraint of trade, as the statute reads, is a violation of law but only those combinations which unreasonably restrain trade. . . . The implication was that this doctrine is too lenient and apparently there was the added thought that the Robinson-Patman act will be more rigid than the so-called "good trust" doctrine. . . .

"If the effort to destroy monopoly is directed only against such monopolies as can be shown to have abused their power, it may be questioned how far reaching the relief will be," said Mr. March, "for the effect of monopoly on the concentration of wealth and consequent limitation of purchasing power of consumers is not conditioned wholly on behavior. . . . In its report to the President in November, 1934, concerning the basing point system of the steel industry, the Federal Trade Commission used these words: 'If the capitalistic system does not function as a competitive economy, there will be increasing question whether it can or should endure. The real friends of capitalism are those who insist on preserving its competitive character.' " . . . It's a big "If" on which the commissioner bases the prospect of this horrendous impending calamity to the much berated capitalistic system, which does, at least, have the merit of making swollen Federal payrolls possible . . . and danger of either it or the competitive disappearing need disturb the golf game of no one unless it be through further Government regimentation and strait-jacketing which is being so strongly urged . . . and will be attempted at the next session of Congress if the New Deal is continued in power. . . .

### Hearings Against Steel Companies To Be Soon

Presidential election takes place in five weeks and hearings on charges against the Carnegie-Illinois Steel Corp., and the Jones & Laughlin Steel Corp., are due soon . . . which no doubt is another one of the many interesting coincidences which have been taking place in the political arena of late . . . and it is another coincidence, if one chooses to be naive, that they center around companies in Pennsylvania, a State which New Deal forces, with the vigorous support of John L. Lewis's Committee for Industrial Organization, are desperately trying to capture. . . . Part of the strategy to make the steel industry the football of politics, David L. Lawrence, Pennsylvania Democratic State Chairman, has charged the two steel companies with coercing employees to register as Republicans under threat of loss of their jobs if they did not do so . . . and this absurdity was sufficient to start the Senate Campaign Expenditures Committee, headed by Senator Lonergan, of Connecticut, on an "investigation." . . . Robert L. Jefferies, secretary of the committee, has announced that the "investigation" has been almost completed . . . when the report is made to the committee it will decide upon action, which means hearings. . . . "The investigators' report is practically finished," Jeffries announced, "and a list of names submitted. We could issue subpoenas and start the hearings as soon as


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More costly materials can frequently be replaced with Thomastrip cold rolled strip steel to increase product sales, speed production and improve profits. Easily adapted for nearly every purpose of stamping, drawing or rolling, Thomastrip provides exacting uniformity of temper, gauge and surface fineness. It is available with dense, non-porous, crack-proof electro coating of zinc or copper, or with plain bright finish as required. Investigate the advantages of Thomastrip. A Thomas representative is ready to cooperate with you.

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THE THOMAS STEEL COMPANY
WARREN, OHIO
*Specialized Producers of Cold Rolled Strip Steel*

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COLD ROLLED STRIP STEEL
BRIGHT STEEL ZINK COATED
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the committee decides upon a course of action" . . . and it is also to be noticed that the so-called labor spy investigation of Senator LaFollette's committee is nicely timed politically. . . . As has been pointed out previously, however, the charges of the Lonergan committee have been sharply countered and demand made that it do investigating of its own household, which is charged with coercing with the use of taxpayers' money, demand that WPA workers register and vote for the New Deal. . . . Senator Davis of Pennsylvania has written a sharp letter to Senator Lonergan charging WPA assistance is being used to influence voters in Pennsylvania and has demanded that the committee make an investigation of the charges. . . . "While your Senate Committee is making this investigation, I wish to challenge it, as I repeatedly challenged the Senate while in session, to examine open evidence of voter coercion in the Works Progress Administration in this State," Senator Davis wrote. "You will be forced to admit that unless your committee has cotton stuffed in its ears and blinders over its eyes, it cannot fail to see the hard hand of the so-called Democrats holding the threat of unemployment over the voters of WPA."

There is a straightforward, hard-hitting challenge from a responsible source . . . and if the committee does not act on it by making a genuine, rather than a synthetic, investigation it will only emphasize suspicion. . . .

# Major Berry Makes New Move To Revise NRA or Substitute

WASHINGTON, Sept. 29.—Seeing that it has blocked his desire for industrial regimentation, Major George L. Berry has broken forth with a blast against the Supreme Court and reiterated a demand for another NRA or its substitute. Lest it may be forgotten, it may be stated that the bustling major bears the empty title of Coordinator for Industrial Cooperation. And it is in this capacity that he has addressed a letter to his council, in which he gravely urges a definite program to do something about "the intolerable situation precipitated by the Supreme Court's interpretation of the law."

With this rather presumptuous proposal, the major also asks the council to do something to bring about another NRA or its alter ego and then, his ambitions still not sated, the major wants to set up a committee to solve the taxation problem!

This is a broad program, even for the bustling major, and its projection only emphasizes the major's vast aspirations. For, after all, his activity as "Industry Coordinator," devoted chiefly to attacks on industry, and most everything else that is the opposite of coordination and cooperation, is only incidental to his political activities.

The latter are seen in his rather amusing tirades as head of the so-called Labor "Non-Partisan" League, vigorously committed to campaigning for the re-election of the New Deal. This, of course, is not to say that there isn't a great deal of political activity in his moves as "Industry Coordinator" against the Supreme Court and on behalf of regimented industry and organized labor dominance. For these are still very distinctly in the mind of the New Deal itself and in making the moves, the major obviously has the blessing, if not the urging, of the New Deal.

The major asked for a meeting of the council Dec. 6 and looking to a newly born Blue Eagle, he said:

"Those who wish to promote the general welfare and contribute to economic progress and stability by adhering to standards of business decency are utterly defenseless against the predatory competition of the exploiters.

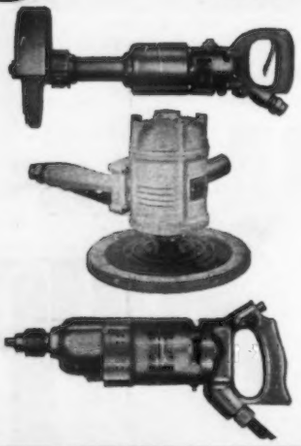
"The council should address itself fearlessly to an examination of the intolerable situation precipitated by the Supreme Court's interpretation of the law."

With this explosive load off his mind, the major assures the council that "substantial progress" has been made during the summer by the council committee on employment and unemployment and asks that it turn to a study of the "whole tax base and structure with a view to determining the effect of the present taxes upon enterprise and employment." To this end the major proposes still another committee.

The fact that the unemployment problem and taxation are being studied, or at least a feint toward such a study is being made by other government branches, does not disturb the major. He wants the council to prepare recommendations for legislation on another NRA and the employment and taxation problems for the next session of Congress. The major is certain he will still be on the job. For he said that, although he was not calling a meeting of the council until after the November election, he could assure its members that there was "no reason for concern as to the council's future."

It will be recalled that the major also assured the country of the


SYNONYMOUS with STRENGTH SIMPLICITY SERVICE . . .



A "synonym" is a word having nearly the same meaning as another. So when we say the name HERCULES (on portable tools) is *synonymous* with Strength, Simplicity and Service we are using the term judiciously.

Strength—for their tasks,
Simplicity—for purpose of maintenance,
Service—over a long, profitable period,
—these are attributes of HERCULES TOOLS that have made them gain steadily in favor ever since the original models were introduced. . . .

*Ask for literature on either Pneumatic or High Frequency Electric models—or both, if you use them.*

THE BUCKEYE PORTABLE TOOL CO.
DAYTON, OHIO
HERCULES

forthcoming accomplishments of his office prior to the first meeting he called last December when the bulk of industry walked out on him. It did so because it was quickly realized he had in mind, as he still has, a determination to renew industrial regimentation, Supreme Court or no Supreme Court. The major so far has not said what he wants the council to do with the Court.

## CONVENTIONS

Sept. 28 to Oct. 3—American Mining Congress, Civic Auditorium, Denver.

Oct. 1 to 2—Porcelain Enamel Institute, Hotel Statler, Cleveland. George P. MacKnight, 612 North Michigan Avenue, Chicago, secretary.

Oct. 5 to 7 — National Industrial Advertisers Association, Benjamin Franklin Hotel, Philadelphia. M. R. Webster, 100 East Ohio Street, Chicago, secretary.

Oct. 5 to 10—Fourth Industrial Materials Exhibit, Hotel Roosevelt, New York. S. S. Kahn, Parker-Kalon Corp., 200 Varick Street, New York, secretary.

Oct. 8 to 10—Electrochemical Society, Hotel General Brock, Niagara Falls, Ont. Dr. Colin G. Fink, Columbia University, New York, secretary.

Oct. 15 to 17—Society of Automotive Engineers, first national aircraft production meeting at Ambassador Hotel, Los Angeles. John A. C. Warner, 29 West 39th Street, New York, general manager.

Oct. 16—Eastern States Blast Furnace and Coke Oven Association, meeting with Chicago District Blast Furnace and Coke Oven Association, Palmer House, Chicago. B. A. Standerline, Wisconsin Steel Co., Chicago, secretary, Chicago association.

Oct. 18 to 22—American Institute of Mining and Metallurgical Engineers, Hotel Statler, Cleveland. Louis Jordan, 29 West 39th Street, New York, secretary.

Oct. 19 to 22—National Wholesale Hardware Association, Marlborough-Blenheim Hotel, Atlantic City. George A. Fernley, 505 Arch Street, Philadelphia, secretary.

Oct. 19 to 22—Wire Association, Hotel Cleveland, Cleveland. Richard E. Brown, 17 East 42nd Street, New York, secretary.

Oct. 19 to 23—American Society for Metals, Metal Congress and Exposition, Public Auditorium, Cleveland. W. H. Eisenman, 7016 Euclid Avenue, Cleveland, secretary.

Oct. 19 to 23—American Welding Society, Hotel Cleveland, Cleveland. M. M. Kelly, 33 West 39th Street, New York, secretary.

Oct. 19 to 23—American Gas Association, Auditorium, Atlantic City. Kurwin R. Boyes, 420 Lexington Avenue, New York, secretary.

Oct. 20—National Association of Sheet Metal Distributors, Marlborough-Blenheim Hotel, Atlantic City. George A. Fernley, 505 Arch Street, Philadelphia, secretary.

Oct. 20 to 22—American Railway Bridge and Building Association, Stevens Hotel, Chicago. Annual convention and exhibit. C. A. Lichty, 319 North Waller Avenue, Chicago, secretary.

Oct. 20 to 22—Bridge and Building Supply Men's Association, Stevens Hotel, Chicago. W. S. Carlisle, 900 West 18th Street, secretary.

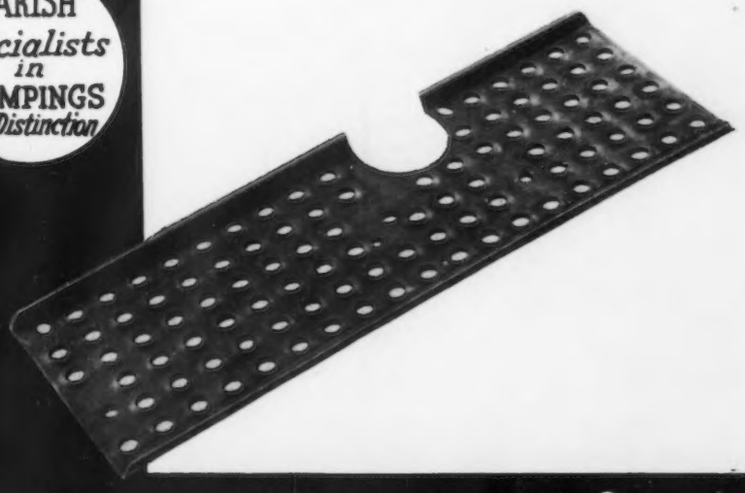
Oct. 21 to 23—American Institute of Steel Construction, Greenbrier, White Sulphur Springs, W. Va. V. G. Iden, 200 Madison Avenue, New York, secretary.

Oct. 22 to 23—American Society of Mechanical Engineers. Fall meeting of iron and steel, machine shop practice and applied mechanics divisions, Hotel Cleveland, Cleveland. C. E. Davies, 29 West 39th Street, New York, secretary.

Oct. 27—Association of Consulting Chemists and Chemical Engineers, Chemists' Club, 52 East 41st Street, New York. Louis Weisberg, 50 East 41st Street, New York, secretary.

Oct. 30 to 31—Foundry Practice Conference, University of Iowa, Iowa City.


PARISH *Specialists in* STAMPINGS *of Distinction*



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Neither the gauge, size nor specifications of a stamping presents any obstacle to Parish. Skill, experience and equipment combine to make difficult stampings comparatively easy in Parish shops.

This non-skid brake step for box cars is 1/4" thick x 30" long x 10" wide. The flange is 1". Embossing around the holes makes the step non-skid. Another of the many types of stampings produced by Parish for many industries.

Have you a problem that could be worked out in pressed metal? Our engineers will do it for you.

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PACIFIC COAST REPRESENTATIVE
F. Somers Peterson Co., 57 California St., San Francisco, Cal.

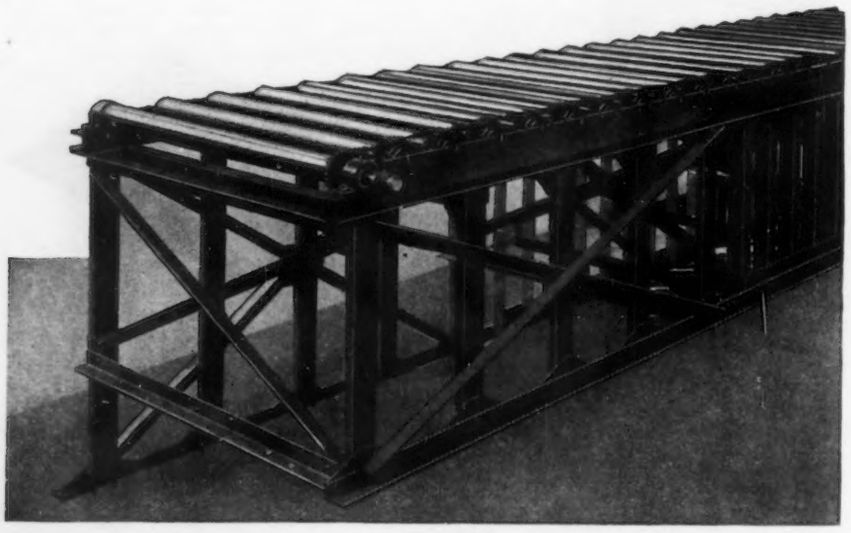
# Shipbuilding Program Calls for 6,527,000 Tons in Six Years

WASHINGTON, Sept. 29.—Calling for large steel and machinery requirements, construction of 6,527,000 gross tons of vessels during the next six years is the wide scale objective under the new Merchant Marine act. Roughly it has been estimated that the program, if accomplished, will involve 2,225,000 tons or more of hull steel.

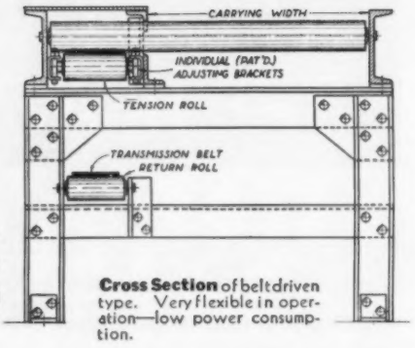
This move to revitalize and modernize the American merchant marine so that it will be on a parity with that of other first-class nations contemplates the building of some 50 or 60 vessels of an aggregate in excess of 1,000,000 tons annually. These vessels would replace ships which in 1942 would be 20 years or older. The program, as stated by Joseph B. Weaver, director of the Bureau of Marine Inspection and Navigation, provides for annual replacement of 433,000 tons in the foreign trade fleet, 305,000 tons in the domestic trade fleet and 349,000 tons in the tanker fleet. Manifestly an important factor in mind in connection with the building program relates to reemployment by providing work for the many industries supplying requirements, reaching back to raw materials through to finished lines, and also stimulating agriculture in connection with marketing activities in the export trade.

Preliminary to uniting Federal shipping agencies and getting the new subsidy program under way, three commissioners of the five-man Maritime have been named by President Roosevelt and are to serve temporarily. They reflect a high-grade personnel and include Rear Admiral Henry A. Wiley, retired; Rear Admiral M. M. Taylor, former Coast Guard commandant and George Landick, Jr., of the Procurement Division, Treasury Department. One of the first tasks of the members of the commission, however, may be that of attempting to settle the serious Pacific Coast labor controversy between ship owners and union workers. The commissioner has no mediatory power, but has power to investigate labor disputes and set minimum wages, maximum hours and working conditions.

Available for the construction fund is a total of some $170,000,000, made up of $65,000,000 in cash and $105,000,000 in outstanding notes, transferred from the old Shipping Board and the Post Office Department. Smaller sums also will become available, such as $3,000,000 from the operating fund of the Emergency Fleet Corp., and $975,000 for liquidation, including preservation of laid up fleets which are to be sold for scrapping. The commission in about 30 days will take over all activities of Federal shipping agencies now existing and take up studies looking to a coordinated governmental shipping policy. One study will be made to learn whether any existing trade routes should be stricken from the Federal subsidy list as non-essential. Another will involve analysis of cargoes, foreign competition, revenues, construction and operating costs, etc., to reach a basis for allocating subsidies. The commission also is faced with the difficult task of adjusting mail carrying contracts, which must be terminated July 1, 1937, to be sub-

**Live Roll Conveyor** with "progressive chain" type of drive. Sprockets welded to circumference of rolls, anti-friction bearings.




**Cross Section** of belt driven type. Very flexible in operation—low power consumption.

# LIVE ROLL CONVEYORS

• Logan Live Roll Conveyors—for sheets, plates, bars, billets, etc.—are simplifying handling problems and lowering costs in a wide range of steel mill applications. Typical examples are the handling of sheets on Shearing Lines and Scrubber Lines. First cost is reasonable—operating expense nominal.

Bulletin No. 10 gives interesting engineering data on several types of Live Roll units as well as gravity and power conveyors of other kinds. If you haven't your copy, write on your letterhead to Logan Co., 545 Buchanan St., Louisville, Ky. Representatives in principal cities.

Logan Conveyors
LOUISVILLE

stituted by direct subsidies fixed on a poundage basis.

Aid for construction of ships in American yards will represent differences between construction and operating costs in the United States and abroad. The act provides that citizens of the United States may make application to the Maritime Commission for the construction of new vessels in essential service. The commission is authorized to make a contract with the shipbuilder for the construction of the vessel and payment to the shipbuilder of the cost of such construction, as Mr. Weaver has pointed out. Concurrently, the commission is authorized to enter into a contract with the applicant for the purchase of the vessel at a price corresponding to the estimated cost of building such a vessel in a foreign shipyard. The applicant is required to pay one-fourth of this estimated cost to the commission, the payments to be made at the time and in the same proportion as provided in the payment of the construction cost in the contract between the shipbuilder and the commission. The balance of the purchase price is to be paid by the applicant within 20 years after delivery of the vessel in not to exceed 20 equal annual instalments, the first of which is to be paid one year after the delivery of the vessel to the applicant. Interest at the rate of 3½ per cent is to be paid on all instalments of the purchase price remaining unpaid.

Rear Admiral Taylor will be succeeded by Rear Admiral Harry G. Hamlet when the latter retires from the Coast Guard service.

## Industrial Exhibit At Pittsburgh Oct. 22

THE second annual industrial exhibit sponsored by the Pittsburgh Association of Purchasing Agents will be held Oct. 22 and 23 at the William Penn Hotel, Pittsburgh. It is expected that several thousand purchasing agents, plant managers, superintendents, master mechanics, metallurgists, general managers and others will attend. I. E. Walton of the Heppenstall Co. is general chairman of the exhibitors' committee.

## Structural Steel Business Recedes

THE steel construction industry experienced a sharp drop in business during August, according to the American Institute of Steel Construction. Bookings of structural steel totaled only 95,390 tons, against 188,053 tons ordered in July. August volume was the smallest for any month this year. Total new business for the first eight months this year, however, was 55.2 per cent of normal, compared with 35.6 per cent for the same period last year. In all 1,034,114 tons was placed from January through August.

Shipments in August likewise decreased. The total came to 127,106 tons, compared with 147,824 tons in July. In eight months this year the total tonnage shipped amounted to 952,344 tons, equal approximately to 50.9 per cent of what is considered normal for the industry.

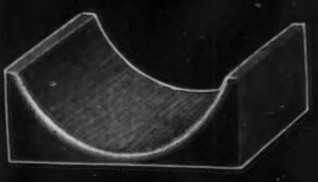
Unshipped orders available for fabrication from Sept. 1 to Jan. 1 were 272,279 tons, as reported by members, with an estimate for the entire industry of 392,446 tons. For fabrication after Jan. 1 the estimated total for the industry is 67,645 tons.


INSUROK

Cuts Power Requirements

28%

THIS INSUROK CG Bearing lasted twelve times longer than the bronze bearing previously used in its place. Operating on a rod mill roughing stand, this INSUROK bearing reduced the power requirements 28 per cent, at the same time eliminating the hazard of oil or grease.



The result . . . Reduced bearing cost per ton; additional rolling time; costly delays eliminated; increased bearing life; greater safety of operation; and a tremendous saving in power costs.

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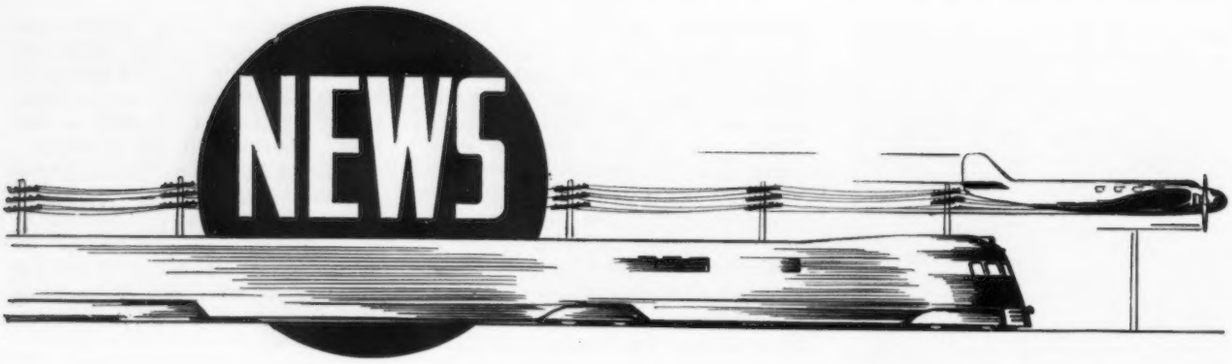


# Corporation Employee Representatives Ask Fairless to Ignore SWOC Tactics

CHARGING "outside agencies" with holding up wage increases in the steel industry, a wage committee representing 10,000 employees of the Carnegie-Illinois Steel Corp.'s Homestead works in a letter to Benjamin F. Fairless requested him to disregard these outsiders' publicity tactics and carry on negotiations between the company and the employee representatives. The employee committee said they were referring to the Steel Workers' Organization Committee backed by John L. Lewis and his Committee on Industrial Organization.

The statement charged that "outsiders" are hindering and embarrassing the drive for a pay boost, and warned Mr. Fairless against "being swayed by the inferences drawn by an outside group of opportunists." The letter follows in part: "For several months the employee representatives have been negotiating with the management in the matter of a general wage increase for employees of the Homestead Steel Works, presenting a request for a flat increase of $1.12 per day for all employees, with a $5 per day minimum. In the meantime, however, certain officials of outside groups apparently sensing that the employee representatives may be nearing a satisfactory settlement of this issue and attempting to place themselves in a position that they can usurp the credit for the same, have released certain newspaper articles to the public press that would infer that they are prepared to take over the employee representatives lock, stock and barrel, call a strike and force an increase through brute force. It is obvious to the employee representatives that this is a weak attempt to "steal the show," but we are wondering if such attempts to build up public opinion on a false promise will not result again in hindering the cause of the worker. If the management is to be consistent in their dealings with the employees, they cannot afford to be swayed by the inferences drawn by an outside group of opportunists. It is our desire that you do not permit this publicity to further hinder us in our negotiations."

---

American Airlines, Inc., has placed an order with Douglas Aircraft Co. for five 21-passenger club type flagships, representing an expenditure of $525,000.

## NEWS AND MARKET INDEX


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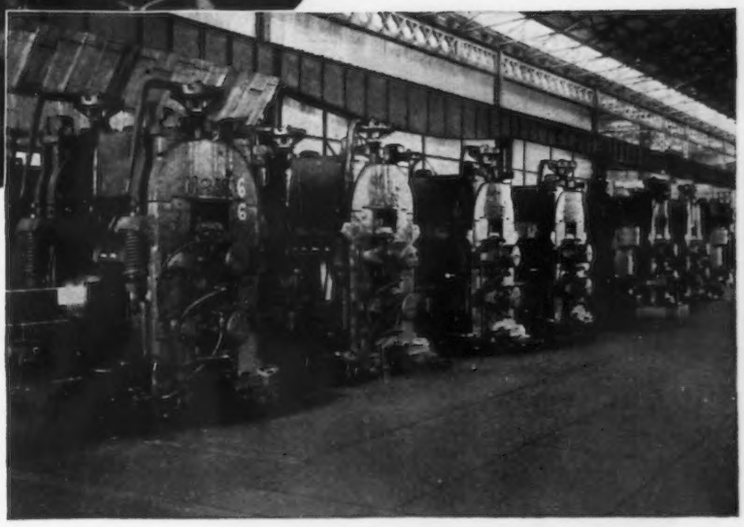
# A BIG MARKET



## *but it carries a* BIGGER ONE

These cars represent only a small part of the great market offered the steel industry by the automotive manufacturers. But there is a greater market hidden in that picture.

Every automobile represents a home. And every home uses iron or steel wire by the mile: in sieves, dish drainers, bed springs, window screens—in thousands of modern conveniences no home can be without.

Made by the million, sold by the million, these modern devices call for efficient production, closer tolerances and greater uniformity in all the materials used. Greater uniformity in the rods, strips and merchant forms will increase production and profit all down the line. Yet you cannot compete in this exacting market if your rolling machinery is designed for the needs of 20-30-40 years ago. It is a new market representing tremendous profits for those who are in step with the demands of industry.

★ ★ ★

You can obtain the required tonnage with the desired accuracy only when your mill can function as a unit. Sound engineering knowledge plus years of experience are producing these results—in the modern Morgan Continuous Rolling Mills.

R-12

**MORGAN CONSTRUCTION CO.**

MORGAN WORCESTER ENGINEERS AND MANUFACTURERS

**WORCESTER MASSACHUSETTS**

## Machine Tool Dealers Elect Officers

AT the annual meeting of the Associated Machine Tool Dealers, held at Granville, Ohio, Sept. 21-22, the following officers were elected for the ensuing year. President, Harry Barney, Barney Machinery Co., Pittsburgh; vice-president, A. G. Bryant, Bryant Machinery & Engineering Co., Chicago; secretary and treasurer, John Sauer, Peninsular Machinery Co., Detroit; directors, Charles E. Moore, Moore Machinery Co., San Francisco, reelected; A. S. Bush, Jr., Charles A. Strelinger Co., Detroit; E. R. Motch, Jr., Motch & Merryweather Machinery Co., Cleveland.

The latter new members of the board represent the expressed wish of the association that younger members should assume responsibilities in association affairs. In this instance both members are sons of men who have been prominent in machine tool circles for many years—Charles T. Bush and E. R. Motch.

The two-day session at Granville featured addresses by Herman Lind of the National Machine Tool Builders Association and Wendell Whipp, active director of the association's marketing committee and head of the Monarch Machine Tool Co., Sidney, Ohio.

## Standard Spring Strike Settled

PITTSBURGH, PA., Sept. 29.—Ending a 45 days' strike and shutdown, more than 500 employees of the Standard Steel Spring Co., Coraopolis, Pa., voted to return to work at the wages and hours that existed at the time of the shutdown. The plants have been closed since Aug. 17, and there was definite evidence that the closing might be permanent, thus causing a loss to the community of an annual payroll of over $1,000,000.

Following the circulation of a petition ultimately signed by 500 workers, a meeting was arranged between management and employees which resulted in a decision to reopen the plants. An open shop is to be maintained. While not all employees can be immediately returned to their jobs, such will be the case as soon as orders for the company's products justify the re-employment. No discrimination against union or non-union workers will be made by the company, except that those involved in acts of vandalism just previous to the closing of the plant will not be re-employed.

The Amalgamated lodge, which called the strike, is disputing the statement by the company that over 500 men have signified their willingness to return, and have indicated that they will picket the plant when it reopens some time this week.

## . . TRADE NOTES . .

**D. S. Mair Machinery Corp.** has moved to 4000 Clayton Avenue, Houston, Tex.

**Eisler Electric Corp.** has acquired interests of Bissett Steel Co., and George Bissett in the Tungsten Electric Corp., Union City, N. J., and hereafter the Bissett Steel Co. and George Bissett will have no further connection with the Tungsten Electric Corp. F. M. Woodford will continue as Western manager at 3030 Euclid Avenue, Cleveland.

**Timken Steel & Tube Co.**, Canton, Ohio, has moved its New York office to 165 Broadway, room 1000.

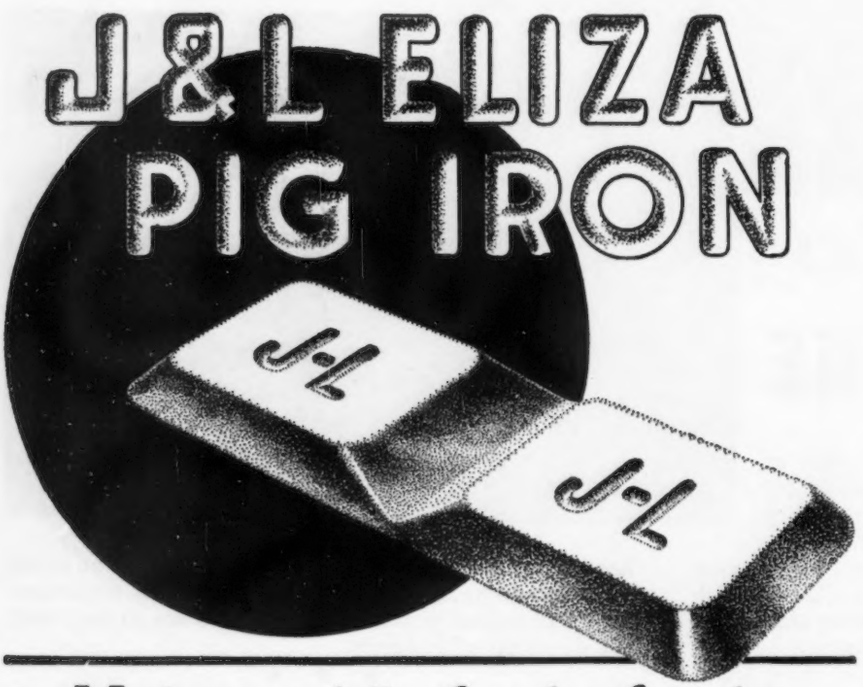
**Factory Tool & Supply Co.**, 195 East South Street, Akron, Ohio, has just been incorporated. R. R. Andrews, formerly president of Central Hardware & Factory Supply Co., is president and E. C. Pfeifle, secretary and treasurer. Manufacturers' catalogs are requested.

**H. E. Eaton Co.**, sales representatives in New York and New England for Michigan Tool Co., Colonial Broach Co., and Detroit Tap & Tool Co., has moved its office to 51 E. 42nd Street, New York.

**Lea Mfg. Co.**, Waterbury, Conn., has appointed Lea Products Co., 686 Notre Dame Street West, Montreal, as exclusive Canadian agents.

**Federal Products Corp.**, 1144 Eddy Street, Providence, R. I., has opened an office at 400 West Madison Street, Chicago. W. E. Carroll is in charge and is assisted by A. M. Grant.

**George P. Reintjes Co.**, manufacturer of supported walls and arches, has appointed D. H. Skeen & Co., One LaSalle Street, Chicago, as sales representatives in that area. Kenneth Williams, formerly in charge of industrial engineering sales for H. M. Byllesby & Co., is manager.


Made especially for the foundry and malleable trade . . . no scrap

JONES & LAUGHLIN STEEL CORPORATION
AMERICAN IRON AND STEEL WORKS
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J&L STEEL

# E. T. Weir Defends Careers of Roosevelt's "Economic Royalists"

IN a signed article in the current issue of *Fortune* magazine, E. T. Weir, chairman of the National Steel Corp., admits that he may be what President Roosevelt has called an "economic royalist," and defends his own career, which started as a $3 a week office boy with that of Mr. Roosevelt, who "was born in a mansion with the legendary silver spoon in his mouth." Mr. Weir charges that the President "sees no future hope in the system that has brought our country so far and so fast. The only solution he offers to the material problems of the country is to strip business men of economic freedom and power in their own enterprises."

Mr. Roosevelt is opposed—not by a small minority, as he says—but "almost unanimously by the business and professional men of the country," Mr. Weir's article points out. "They know that, if continued to a logical conclusion, his tampering would hamstring the whole economic life of the nation. We feel that the interests of the country and all its people will be best served if Mr. Roosevelt returns to Hyde Park, instead of to the White House.

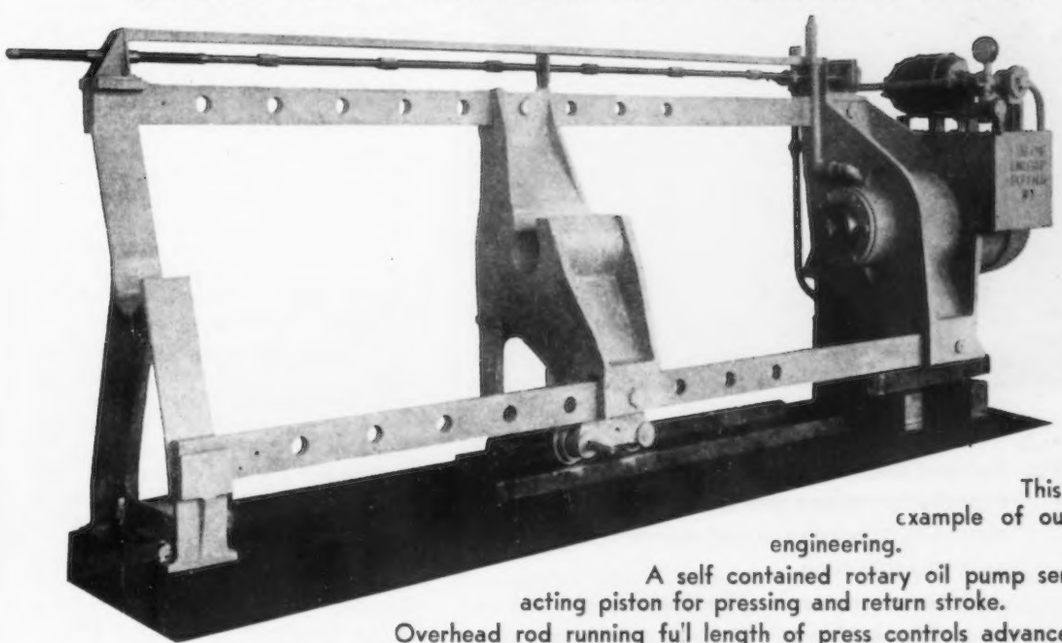
"I am not among those who believe that four years more of Mr. Roosevelt would ruin the country. The country has too much vitality, its resources are too great, its people have too large a fund of old-fashioned common sense for any one man or party to impair it permanently. But, I do not believe that Mr. Roosevelt is personally adequate to the demands of his office. I do not believe that his political, social and economic ideas can flourish on American soil when they have failed wherever else they have been tried. I believe four more years of attempts to force these ideas upon the United States will work serious harm by delaying our return as a people to the undramatic but sensible and practical conditions which fostered and supported our continuing progress."

Mr. Weir compares his own career and that of other "economic royalists" with that of Mr. Roosevelt. He writes:

"I believe that I am warranted in the assumption that I am one of the men whom Mr. Roosevelt now calls an Economic Royalist. I have personal means. I am the chief executive of a large corporation and I have been and am opposed to the policies and actions of this Administration. I deny that these things, in themselves, make me an anti-social force, or that I have ever used them in an anti-social manner. I do not expect the reader to accept as impartial my judgment on my own career. Nor would the reader be justified as accepting as impartial Mr. Roosevelt's judgment. There are facts from which the reader may draw his own conclusions. The time is overripe for the matching of Mr. Roosevet's rhetoric with the facts of the life and action of the type of man he attacks. I submit myself for the comparison.

"In the whole country it would be difficult to find a man who has


**MODERN DESIGN OF FORCING PRESS**



**100 TONS**

**40″ BETWEEN BARS**

**120″ MAX. RAM TO CARRIAGE**

This machine is an example of our progressive engineering.

A self contained rotary oil pump serves the double acting piston for pressing and return stroke.

Overhead rod running fu'l length of press controls advance and return of piston, also its speed. Rapid advance under low pressure.

Used by large electrical manufacturer for pressing armatures on shafts.

Write for further details giving size and tonnage wanted.

**LAKE ERIE ENGINEERING CORP.**

**68 KENMORE STATION, BUFFALO, N. Y.**

less right than Mr. Roosevelt to call other men Economic Royalists. Our American idea of royalty is based upon the European tradition. Mr. Roosevelt's life has approximated that tradition about as closely as any that could be found in the United States. He was born in a mansion, and in his mouth was the legendary silver spoon. Attending his birth was a heritage of great wealth and family prestige. His childhood and youth were lived under the shelter of wealth, attended by servants and tutors, far removed from contact with realities. Far from having to make his own way early in life, his years at Groton and Harvard were unclouded by any need to borrow or earn the money to pay for his education.

"When he finally entered the world, he did so with the backing of his wealth and with the way before him made smooth by the influence of the Roosevelt name. When he married, he never knew the most compelling responsibility a man can have—the necessity to succeed in his work so that he may be able to provide for the needs of his family. He never went through the grim competitive battle that every man must endure who fights his way from scratch. His experience with business has been narrowly limited. Most of his life has been spent in politics. He has never experienced the anxiety of the man who must find work for a large group of employees, and must meet a pay roll week after week. He has never occupied an executive post where he was responsible for the manufacture of products or the performance of services under competitive conditions. In fact, his whole knowledge of business has been academic, his experience that of the outsider or the dilettante. Yet the wealth that has supported him throughout his life and now contributes to his support is mainly invested in business enterprise.

"I do not cite these things because they are wrong. It is no indictment against Mr. Roosevelt's character to say that he was not reared as a poor boy, or that with no necessity for so doing he failed to undergo the hardships that have been and are the common experience of the vast majority of his countrymen. I do not consider it wrong for him to draw income from wealth that was accumulated through the hard work of his ancestors. I do say emphatically, however, that his background does not entitle him to call other men Economic Royalists and that his experience has not equipped him to pass judgment on the actions in their own fields of the men he calls Economic Royalists.

### Own Life a Contrast

"Like that of most other American business men, my life has been in direct contrast to that of President Roosevelt. I was born a commoner, have lived a commoner and am still a commoner. My parents were people of extremely moderate means. I went to a public school, wore the same kind of clothes, had to do the same kind of chores and played the same kind of games as most boys in the respectable but unpretentious Pittsburgh neighborhood in which I was born. My father died when I was 15. It was necessary for me to find work if there was to be food on the table. I landed my first job as an office boy with a wire company. If royal blood coursed through my veins, I was not conscious of it.

"During the next ten years—the hard times of the '90s—I worked my way upward through a succession of positions. If I was at any time the beneficiary of any 'special privilege,' I did not know it. The only way I could hold a job was to do satisfactory work.

"When I was 30, I joined with a small group of associates in a business of our own. By pooling our savings and by borrowing what money we could, we managed to swing the purchase of a small and badly run-down tin-plate mill in Clarksburg, W. Va., which was bankrupt and had been idle for three years. In a short time the president died and I was elected to take his place. Now I should have experienced some of the 'special

These important advantages are found in no other one type of power drive.

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Whitney Silent Chain Drives offer a solution to the most difficult drive problems. They have extra capacity for sudden overload, are not affected by atmospheric conditions and maintain positive and uniform production.

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WHITNEY CHAIN DRIVES
POSITIVE POWER TRANSMISSION

privileges.' I do not remember any, and I have a very good memory.

"We were a young and untried outfit. We had an old plant and inefficient machinery. We had to fight every inch of the way. We had to meet our payrolls and pay for our materials c.o.d., the wages we took home to our families often were less than those paid to many of our employees. Every dollar we could spare had to go into new machinery. We could get business only by promising quality, prices and service that met those of our keenest competitors. To keep the business, we had to keep our promises. Back of any man who has succeeded in business is a long record of unbroken promises. The business man who breaks promises does not stay in business.

"Our backs were against the wall many times in those early days. We operated on a shoe-string budget. Too many mistakes, one big mistake, or even some accident beyond our control could have broken us. We received no favor or 'special privilege' and expected none. Whatever our straits, employees received their wages; equipment and material suppliers received their payments; customers received their orders at the agreed prices; governments received their taxes. Every dollar I have today has come from that plant and the large company that grew from it. No one ever gave me anything."

## Electrochemists to Meet Oct. 8-9-10

ON Oct. 8, 9 and 10 electrochemists from all over the world will again convene at Niagara Falls. Their headquarters this year will be at the Hotel General Brock, on the Canadian side.

The Thursday morning session will be devoted to "What the Electric Furnace Has Done for Civilization," and experts in this field from Westinghouse, Shawinigan Chemicals, Ltd., Acheson Graphite Corp., Norton Co., Tennessee Valley Authority, Aluminum Co. of America and others will discuss the basic importance of the many electrochemical products.

The electrochemical industry is one of the largest consumers of power and, on this account, the entire afternoon of Thursday, Oct. 8, will be devoted to a discussion of present-day power economics. A. J. Wager, well-known consulting engineer of Milwaukee, will preside. L. W. W. Morrow, editor of the *Electrical World*, and H. A. Person, of the Federal Light & Traction Company, New York, will point out the advantages of steam power. R. J. Gaudy, engineer, of Chicago, and James W. Rickey, of the Aluminum Co. of America, will champion hydro-electric power for the aluminum industry. Carl F. Floe will bring to the electrochemists' attention the vast blocks of hydro-electric power soon to be available in the Pacific Northwest.

Among the prominent speakers to address the gathering is Willis R. Whitney, vice-president of General Electric Co., who will emphasize the importance of more research.

Among other topics to be discussed is that of corrosion of iron and steel, and how to prevent porosity of zinc and nickel coatings on steel. Newcomers in the electroplating field are molybdenum and zirconium. W. P. Price and O. W. Brown, of Indiana University, have discovered how to plate molybdenum on copper and other metals; and W. E. Bradt and H. B. Linford, of the University of Washington, will report on zirconium plating.

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You can step-up your "automatics" 30% to 40% with the "Ace of screw stocks." And it gives this increased production without sacrifice of quality

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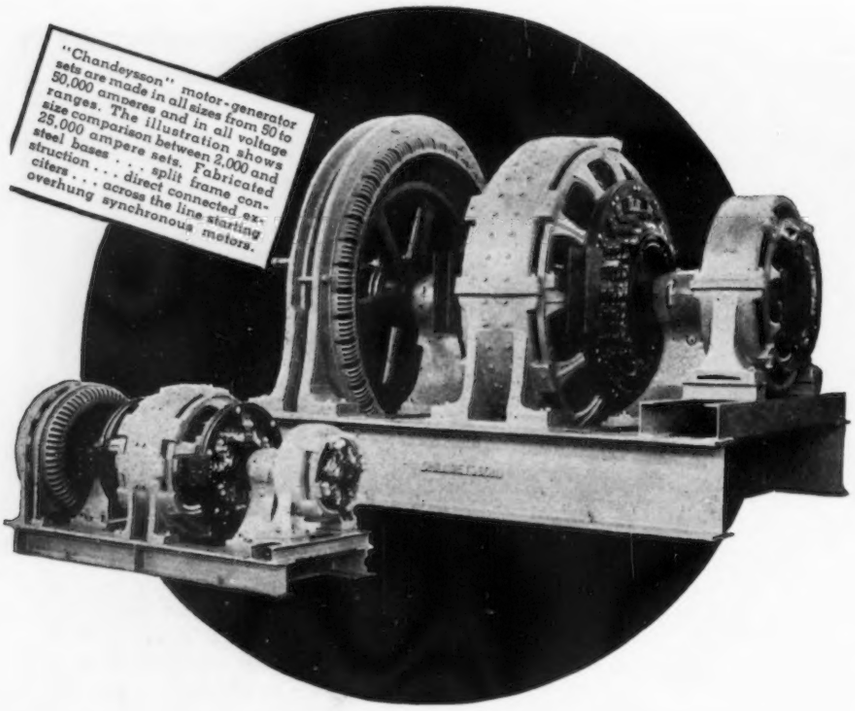
## Indian Steel Companies Merge

LONDON, ENGLAND (*Special Correspondence*).—Details of a plan for amalgamating the Bengal Iron Co. with the Indian Iron & Steel Co. have just been published. The Bengal Iron Co. is to be taken over for approximately $9,750,000. By complete amalgamation it will be possible to extend operations into steel without any restrictions.

Substantial economies will be effected by merging the companies and the directors say that a dividend is now in sight for the ordinary shareholders of the amalgamated companies.

The profit sharing agreement reached by the two companies in 1925 ultimately proved a cause of serious friction between them and thus failed to achieve its original purpose, namely, a real unity of interest. Complete amalgamation will remove this source of difficulty and will at the same time permit the amalgamated company to take an active interest in new steel developments in India. Both companies were hampered in fulfilling their ambitions in this respect owing to the terms of the profit sharing agreement.

The current year's profits to date of both Indian and Bengal companies are higher than those for a comparative period a year ago. Profits of the two companies for the whole of last year totaled $1,435,000.



"Chandeysson" motor-generator sets are made in all sizes from 50 to 50,000 amperes and in all voltage ranges. The illustration shows size comparison between 2,000 and 25,000 ampere sets. Fabricated steel bases . . . split frame construction . . . direct connected exciters . . . across the line starting overhung synchronous motors.

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## IS THE HEART OF THE PLATING PLANT

● What about the most important piece of plating equipment in your plant? Does it need frequent repairs necessitating costly production interruptions? Are your generator maintenance expenses high? These are questions which the wise plating plant executive might well consider.

Throughout the electroplating industry, "Chandeysson" motor-generators are noted for their remarkable ability to function year in and year out, with frequent overloading in both amperes and volts, at an absolute minimum of maintenance expense. They are truly dependable sources of low voltage direct current.

Whether you are considering the purchase of a plating generator now or later, get the facts on "Chandeysson" machines. The Udylite engineer will be glad to give you details without obligation.

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## Steel Institute Meets in Germany

SOME 400 British metallurgists and members of the British Iron & Steel Institute visited Germany during the third week of September for the fall congress of the Institute. This was the first German meeting in 34 years.

During their stay, the British metallurgists visited important works in the Ruhr, exchanging views and technical knowledge with German metallurgists and renewing old connections between British and German iron and steel industries. James Henderson, treasurer, acted as chairman in the absence through illness of Sir Harold Carpenter, president of the Institute.

The proceedings were opened with a joint meeting of the Iron & Steel Institute and the German Society of Iron Metallurgists, whose president, Dr. Fritz Springerum, of Dortmund, welcomed the British visitors and read a telegram of greeting from Dr. Schacht, Reich Minster of Economics. Dr. Springerum also delivered the first paper, which dealt with the development of the German iron and steel industry during the last 15 years, and the problems encountered by German industry due to difficulties in obtaining raw materials.

## Government to Take Bids on Two Jobs

WASHINGTON, Sept. 29.—The Bureau of Supplies and Accounts will receive bids Oct. 6, for 886 tons of shapes and a small lot of bars and rods to be used for rebuilding piers at the Key West, Fla., naval station.

On Oct. 13 the bureau will open bids for 268 tons of high tensile plates for use in boilermakers' shops in connection with torpedo tubes for destroyers.

## FINANCIAL NOTES

**Ross Gear & Tool Co.** has voted a dividend of 60c. a share on the common stock payable Oct. 1 to stockholders of record Sept. 30. On July 1 an extra payment of 30c. was made in addition to the regular quarterly payment of 30c.

**Vanadium-Alloys Steel Co.** in the year ended June 30, 1936, earned a net profit of $592,216, compared with $357,377 in the previous fiscal year. According to Roy C. McKenna, president, directors will authorize during the current year, the distribution of dividends "In such amounts as will enable us to avoid payment of penalty taxes on undistributed earnings.' Necessary improvements are now being made at the company's Latrobe and Monaca plants so that the outlay for this purpose will be larger than for several years past. Exclusive of officers and directors, employees have been extended the opportunity to purchase stock of the company at market price upon installment payments.

**National Steel Corp.** and subsidiaries reports for fiscal year ended June 30, 1936, net income of $10,003,171, which equals $4.64 a share on 2,156,977 par $25 shares. Federal tax on undistributed earnings has not been computed. ... ... ... ... ....

**New Britain Machine Co.** stockholders have authorized an increase in the capitalization from 80,000 shares to 200,000 shares, and the sale of 40,000 shares or any part, to common stockholders in proportion to holdings.

**Interlake Steamship Co.**, Cleveland, has declared a dividend of 25c. a share, with an extra dividend of 50c. a share, payable Oct. 1 to stockholders of record Sept. 18.

**Gulf States Steel Co.**, at a special meeting of its stockholders on Oct. 21, will submit a plan to issue $7,000,000 of 25-year sinking fund 4½ per cent bonds and to offer common stockholders approximately 98,750 shares of unissued common. In order to secure the $7,000,000 bond issue the plan stipulates that the company's properties be placed under closed mortgage. It further proposes to redeem the company's outstanding debentures and preferred stock and to use additional funds for improvements and working capital to expand the range of products.

A plan of recapitalization of **Otis Steel Co.** will be voted upon by stockholders at a meeting on Nov. 2. The right for holders of outstanding prior preference stock to exchange each share for 1.28 shares of new 5½ per cent convertible first preferred stock will be sought. The new stock will have priority over all other stocks and bear cumulative dividends from March 15, 1936, and a half share of common stock.

**National Steel Corp.** had net income of $10,003,171 for the 12 months ended June 30, equal to $4.64 a share. For the first half of this year earnings were equal to $2.40 a share as compared with $3.04 a share in the same period of 1935. The decrease in profits in the first part of 1936 was due in large measure to the effects of the flood, adverse weather generally and price cutting.

**Republic Steel Corp.**, by its recent action in paying dividend accumulations of $4.50 per share on the prior preference 6 per cent convertible stock, has brought nearer the time when the company will be in a position to resume payments on the common stock.

## Myron C. Taylor Back From Europe

MYRON C. TAYLOR, chairman of the United States Steel Corp., returned on the Normandie from Europe on Monday. Interviewed by ship news reporters, Mr. Taylor said that steel mills in central Europe are running at capacity, while the British are placing some orders here which they could not fill at home or on the Continent of Europe.


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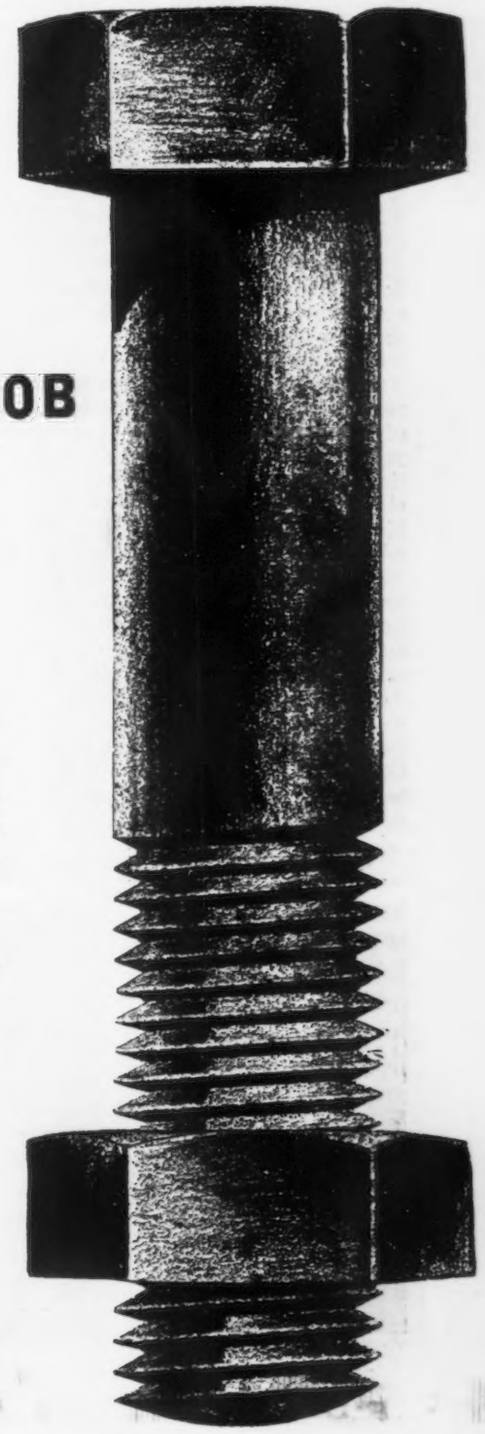

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## ..PERSONALS..

DOUGLAS G. BUCHANAN has been appointed general superintendent of the Carnegie-Illinois Steel Corp.'s Vandergrift works, Vandergrift, Pa., succeeding W. H. GOODHUE, retired. Mr. Buchanan was graduated from the Sheffield Scientific School, Yale University, class of 1917, and entered the United States Army, serving as a first lieutenant overseas. At the time of his discharge in 1919 he entered the employ of the National Tube Co. at Lorain, Ohio, in the open-hearth department. In 1923 he was employed by the American Sheet & Tin Plate Co. at the Vandergrift works, as night superintendent of the open-hearth department and in 1931 was promoted to superintendent. He was appointed assistant general superintendent of the Vandergrift works in 1935.

WILLIAM L. GOODHUE, who has retired as general superintendent of the Vandergrift works after 47 years of service in the sheet and tin plate industry, entered the employ of the Standard Iron Co., Martins Ferry, Ohio, in 1889. He advanced by various promotions with that company to the superintendency of the plant in 1902, continuing in this capacity until 1910, during which period the original company successively became the Aetna Standard Iron & Steel Co., the American Sheet Steel Co., and the American Sheet & Tin Plate Co. From 1911 to 1916, he served as district manager of the American Sheet & Tin Plate plants in the Wheeling district, and from 1916 to 1921 was district manager of the Dover district plants of the same company. From 1921 to 1932 as manager of the Mercer works and continued as manager following the merging with the Farrell works, until March 1, 1935, when he was promoted to the position he held at the time of his retirement.

FRANK J. CHRISTIE has been appointed assistant general superintendent of the Vandergrift works, succeeding Mr. Buchanan. Mr. Christie was graduated from Allegheny College and began his service with the United States Steel Corp. at the Farrell works of the Carnegie Steel Co. in 1914, in the mechanical department. He was appointed assistant superintendent of the rolling department in 1919. In 1923 he was transferred to the Mercer works of the American Sheet & Tin Plate Co. at Farrell, Pa., and in 1931 was made superintendent of the hot mill. In 1933 he was transferred to the Vandergrift works as assistant superintendent of the sheet mill department, later being promoted to superintendent of that department.

DAVID S. PYLE, general superintendent of the Carnegie-Illinois Shenango and New Castle plants, has resigned, owing to ill health, after 40 years of service in the manufacture of tin plate. He began his career as a bookkeeper for the Fulton Iron Co., New Castle, Pa., in 1889. He was employed by the Pittsburgh Iron & Steel Engineering Co. in 1892 and assisted in building the Bessemer plants of the Shenango Valley Steel Co., New Castle, and the Monongahela Blast Furnace Co., McKeesport, Pa. In 1893 he attracted the attention of George Greer, a prominent figure in the development of the tin plate industry, and was employed to assist in the building and operation of the tin plants for the New Castle Steel & Tin Plate Co. In 1897, Mr. Pyle was active in the planning and building of the Shenango works of the Shenango Valley Steel Co., which was combined in 1898 with other tin plate plants under the name of the American Plate Co. In 1905, Mr. Pyle became manager of the Shenango works of the newly-formed American Sheet & Tin Plate Co., continuing in that capacity until 1932, when he was made manager of both Shenango and New Castle works, which position he held at the time of his retirement.

R. E. STURDY has been appointed general superintendent of the New Castle works, New Castle, Pa., succeeding Mr. Pyle. Mr. Sturdy was graduated from Purdue University in 1914, as a mechanical engineer, and began his service with the American Sheet & Tin Plate Co. in 1919 as assistant master mechanic at the Farrell works. In 1921 he was transferred to the engineering department at the general offices at Pittsburgh. In 1923 he was made a master mechanic at the National works at Monessen, Pa. Later he was transferred as master mechanic and manager's representative at the New Castle works, and on Jan. 1 was made assistant general superintendent.

CARL E. CRAWFORD has been appointed general superintendent of the Shenango works, New Castle, succeeding Mr. Pyle. Mr. Crawford was graduated from the University of Indiana in 1908 with a B.A. degree in chemistry. Later he took up post graduate work in metallurgy at Columbia Univer-

D. G. BUCHANAN

W. L. GOODHUE

D. S. PYLE

R. E. STURDY

sity. He entered the employ of the United States Steel Corp. at the Vandergrift works of the American Sheet & Tin Plate Co. as a student in 1909. Since that time he has served as assistant to the general superintendent at the Gary tin mill, Cambridge and Saberton works, and assistant general superintendent at the Laughlin & National Works, Pittsburgh, and 10 years as general superintendent at the Saberton works, Morgantown, W. Va., until Aug. 1, 1934, when he was made assistant general superintendent at the Shenango works.

THEODORE W. DANIELS has been appointed assistant general superintendent of the Carnegie-Illinois Steel Corp.'s Roll and Machine works, Canton, Ohio. He was graduated from Bowdoin College in 1913 and entered the employ of MacIntosh-Hemphill, where he worked as chemist until 1916. From 1916 to 1917 he was employed by the Electric Steel Casting Co., Indianapolis. In 1917 he entered the employ of the Wheeling Mill & Foundry Co., Wheeling, W. Va., and served as metallurgist, open-hearth superintendent and manager of the Warwood plant until 1931, when he became associated with the Pittsburgh Roll Corp., Pittsburgh, as superintendent of the roll foundry. From 1932 until the time of his appointment he was employed by the MacIntosh-Hemphill, Pittsburgh, as superintendent.

HOWARD V. CLARK has been appointed general manager of order division, general sales department of the Carnegie-Illinois Steel Corp. with offices in the Carnegie Building, Pittsburgh, and at 208 South LaSalle Street, Chicago. This position is a newly-created one and will consolidate under Mr. Clark's supervision the several order divisions of the former Carnegie Steel Co., Illinois Steel Co. and American Sheet & Tin Plate Co. Mr. Clark, a graduate of Annapolis and a former officer in the United States Navy, began his service with the old Carnegie Steel Co. in the general offices at Pittsburgh, advancing through successive promotions to assistant manager of sales for the Detroit sales district, which assignment he leaves to take up his new duties.

L. B. WORTHINGTON has been appointed assistant manager of sales for the Detroit district, with offices in the General Motors Building, Detroit. Following his graduation from the University of Illinois, Mr. Worthington started his business career as an apprentice at South Chicago works of the former Illinois Steel Co., serving in various capacities in the operating and producing divisions. Later, concentrating on sales work, he was gradually advanced to assistant manager of sales for the Chicago district, and shortly thereafter promoted to the St. Paul-Minneapolis district, with full charge of selling activities there.

WILBER G. SOMES has been appointed manager of sales in charge of the St. Paul-Minneapolis district, succeeding Mr. Worthington. Mr. Somes was first employed in the heavy forgings division of the former Carnegie Steel Co., making successive advances until the World War when he carried on special contacts with the Government in providing steel supplies under the supervision of the American Iron and Steel Institute. Subsequently he joined the selling organization at Detroit, where he served as chief clerk until 1931, when he was appointed assistant manager of sales at Cincinnati.

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J. C. NIERATH has been elected president of the Kilby Mfg. Co., Cleveland, to fill the vacancy caused by the recent death of John H. Francis. Mr. Nierath has been connected with the company 44 years and during the past 20 years has been its vice-president and treasurer. E. H. GEHLBACH, who has been connected with the company several years as cashier, has been elected secretary and treasurer.

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GEORGE TORRENCE, formerly president of Link-Belt Co., Chicago, and also formerly first vice-president, Illinois Manufacturers' Association, has become vice-president and general manager of the Rayon Machinery Corp., Cleveland. The latter company, which will engage in the production of patented machinery to be used in a new continuous process for spinning rayon yarns, is a subsidiary of the Industrial Rayon Corp.

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DAVID H. BELLAMORE, export manager of Republic Steel Corp., has sailed for Europe on business.

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J. W. WEITZENKORN, former president of the Molybdenum Corp. of America, has become associated with the Ohio Ferro-Alloys Corp., Canton, Ohio, as director of research.

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W. J. HOLTMEIER has been made manager of the newly established Eastern branch office, at 148 West 23d Street, New York, by Hammond Machinery Builders, Inc., Kalamazoo, Mich.

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GEORGE W. DUNCAN, who was connected for 16 years with the

C. E. CRAWFORD

H. V. CLARK

L. B. WORTHINGTON

W. G. SOMES

fractional motor department of the General Electric Co., Fort Wayne, Ind., has resigned and joined the sales staff of the Ohio Electric Mfg. Co., Cleveland, as assistant motor sales manager.

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E. N. BEISHEIM has resigned from the sales staff of the Bunting Brass & Bronze Co., Toledo.

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M. L. JOSEPH has resigned from the United States Bureau of Mines, where he has conducted blast furnace investigations since 1919, to become professor of metallurgy at the Minnesota School of Mines and Metallurgy, Minneapolis. For the past year he supervised a plant investigation conducted jointly by the Inland Steel Co. and the bureau on the effect of oxides in pig iron on the oxides in basic open-hearth steel. F. W. SCOTT, who made the oxide determinations in this investigation, has resigned from the Inland company and will be associated with Mr. Joseph in teaching and in conducting research.

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WALTER D. SNYDER, who retired recently from the United States Navy as lieutenant commander after a number of years of active duty, has been appointed Eastern sales representative for the Ajax Mfg. Co., Cleveland. His offices are located in the Dewart Building, New London, Conn.

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MAURICE B. HULL, for a number of years an executive in the tractor works of International Harvester Co., Milwaukee, has been promoted to general superintendent of the new International tractor works established at Neuss, Germany, employing 2500 workers. He sailed from New York on Sept. 30 with his family.

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G. V. PARKINS has been elected president of the McKeesport Tin Plate Co., McKeesport, succeeding the late E. R. Crawford. Mr. Parkins, who had been vice-president, has been with the company since 1903 at which time it began operations, having been incorporated in 1901. Mr. Parkins started in as clerk and served in various positions through the last 33 years.

CHARLES BRECHEMIN, heretofore Eastern sales manager, has been elected vice-president and director. He has served in various capacities with the company for many years.

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WALTER N. LARKE, for the last two years assistant superintendent of the engine plant at Buick Motor Co., Flint, Mich., is now superintendent of that division. FRANK W. LETTS, general foreman of the crankshaft department for the last two years, has been named assistant superintendent. Mr. Larke has been a Buick employee for 27 years, starting work as a general mechanic in the engine plant in 1910. Through a series of promotions he finally became assistant superintendent in 1934. Mr. Letts joined the Buick organization in 1912 as an office boy. He later became a machine operator, foreman of the connecting rod department. He was foreman of the crankshaft and balancer departments up until 1934, when he became night superintendent of the engine plant. After three months he was promoted to general foreman of the crankshaft department, which position he held until his recent appointment.

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R. B. MCCOLL, vice-president of the diesel engine division of the American Locomotive Co., New York, has resigned to become president of Alco Products, Inc., a subsidiary of the American Locomotive Co. He succeeds JOSEPH DAVIS, who has resigned because of ill health. Mr. McColl was born in Scotland and received his technical training there. He came to America in 1905 and became identified with the Montreal Locomotive Works, Ltd., serving in various departments until he became assistant superintendent, then superintendent of works and finally works manager. In 1917 he was appointed manager of the munitions department of the Eddystone Munition Co. He returned to England after the War, where he became identified with the Armstrong Witworth Co. In 1922 Mr. McColl joined the New York office of the American Locomotive Co., the following year was appointed assistant manager of the Schenectady plant, and in 1925 manager of the plant. Six years later he was elected president of the McIntosh & Seymour Corp., Auburn, a division of the Locomotive company. When the McIntosh corporation was merged with the parent company, Mr. McColl was appointed vice-president of the diesel engine division.

R. B. McCOLL

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LESTER M. CURTISS, who has been superintendent of production of the Lukens Steel Co., Coatesville, Pa., has been promoted to the post of assistant general superintendent. He was graduated from Lafayette College in 1915 and joined Merck & Co., serving in the chemical manufacturing department for a year. After serving as a lieutenant during the war, he joined the Lukens company in 1919 as assistant engineer of tests, holding that position until 1923, when he was made engineer of tests. Two years later he became assistant superintendent of plate mills and later superintendent of the company's 140 in. and 206 in. plate mills. He retained supervision of these two mill units until 1932, when he was promoted to the superintendency of plate mills. He was appointed superintendent of production last fall.

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DAVID DASSO, who has been appointed vice-president of the diesel engine division, succeeding Mr. McColl, was born in Lima, Peru. After taking some preliminary engineering work at the School of Engineers, Lima, he came to the United States and attended the University of Illinois for one year. He was graduated in 1912 in mechanical engineering from Massachusetts Institute of Technology. He returned to his birthplace to take over the management of the Vulcan Iron Works and secured the agencies of a number of lines, including automobiles, trucks and diesel engines. In 1932 he was appointed New York representative for Sulzer Brothers, Ltd., Winterthur, Switzerland. For the past year he has been managing director of the Sulzer company in Buenos Aires.

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FREDERICK R. WARD has been appointed assistant superintendent of the finishing mill and special process department of the South Chicago works, Republic Steel Corp. Mr. Ward is a graduate of Carnegie Institute of Technology. In 1909 he was employed as chemist by Corrigan-McKinley Steel Co. and five years later was made chief chemist of the American Manganese Mfg. Co. In 1923 he became superintendent of operations for the Graham Furnace Corp. Before joining the Republic organization he was associated with Jones & Laughlin Steel Corp., Pittsburgh works, as superintendent of the bar and structural mills.

## ...OBITUARY...

A. W. WYCKOFF, president of the Wyckoff Drawn Steel Co., Pittsburgh, died Sept. 25 at his home in Pittsburgh. He was born May 18, 1873, at Elmira, N. Y. Mr. Wyckoff was graduated from Cornell University. He began his business career with the Bethlehem Steel Co. at South Bethlehem, Pa., beginning in the mill and remaining with this company for five

A. W. WYCKOFF

years. He then entered the employ of the Colorado Fuel & Iron Co. as Eastern engineer representative with headquarters at Pittsburgh. Two years later he became general superintendent of the Bullock Electric Mfg. Co., now the Allis-Chalmers Co. Later he organized the A. W. Wyckoff Co., with headquarters at Pittsburgh, representing the Western Electric Co., Chicago, and the Wagner Electric Co., St. Louis. He conducted this business up to the time the United States entered the World War, when he was commissioned a major in the Chemical Warfare Service and saw service in France. In 1919 he organized and became president of the Wyckoff Drawn Steel Co. with plants at Ambridge, Pa., and Chicago. He was also a director of the A. Wyckoff & Sons Co., Elmira, N. Y.

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SHIRLEY S. FRENCH, formerly general manager of the Berger Mfg. Co., and treasurer of the former Central Alloy Steel Corp., Canton, Ohio, died Sept. 18 of a heart ailment, age 55 years. Born in Garrettsville, Mr. French's first employment was in 1900 as a tally boy with the old Republic Iron & Steel Co. Later he was engaged in an engineering capacity in the construction of the Gary steel plant. In 1913 he became chief clerk of the Brier Hill Steel Co., Youngstown. Later he was manager of the William Todd Co., and in 1917 became vice-president and general manager of the General Fireproofing Co., both in Youngstown. He was general manager of the Berger company from 1926 to 1930, and in the latter year became vice-president and in 1931 assistant general manager of the Lyon Metal Products Co., Aurora, Ill. Soon after he assumed the latter position, his poor health necessitated his retirement. One son, C. S. French is connected with the Cleveland district sales staff of the Republic Steel Corp.

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SAMUEL MONTGOMERY KINTNER, vice-president in charge of engineering of the Westinghouse Electric & Mfg. Co., who was internationally known in the engineering world for his research work and pioneering in the development of radio communication and broadcasting, died at his home in Pittsburgh, on Sept. 28.

Dr. Kintner was born in New Albany, Ind., Dec. 11, 1871. He received his early education in the public schools of that city and his technical education at Purdue University, from which he was graduated in 1894 after completing a course in electrical engineering. After spending a year on telephone construction and operation he accepted a position as assistant to Professor Fessenden at the Western University of Pennsylvania. He continued in this position for about two and one-half years and later was made assistant professor of mathematics and later professor of engineering, succeeding Professor Fessenden when he left the University. During this period he worked with Fessenden on many investigations on Hertz waves, X-rays, and other interesting phenomena that were just coming into prominence at that time. He remained professor for three years and resigned in the summer of 1903 to accept a position with the Westinghouse Electric & Mfg. Co. in the research department.

After a few years he was made design engineer in charge of a.c. railway motor design. In 1911 he resigned from the Westinghouse company to become general manager of the National Signaling Co., and then engaged in developing the inventions in radio of Fessenden. He later became vice-president and finally president. During this period the heterodyne system was reduced to a practical commercial form, the Arlington radio station of the Navy Department was installed, and several other important installations for the United Fruit Co. and others were made. Following the War he negotiated a sale to the Westinghouse company of the patent rights of his company, which later were sold by the Westinghouse company to the Radio Corp. of America. After spending approximately two years with the Westinghouse company in assisting it in getting started on its radio developments, he was appointed to the managership of the research department. On April 16, 1930, he was elected assistant vice-president in charge of engineering activities. In the same year the University of Pittsburgh conferred upon him the honorary degree of doctor of science.

## ....PIPE LINES....

**Natural Gas Pipe Line Co. of America, Inc.**, 20 North Wacker Drive, Chicago, plans welded steel pipe line in part of Muscatine County, Iowa, for gas transmission.

**Northern Indiana Public Service Co.**, Hammond, Ind., plans two welded steel pipe lines in part of Lake County for natural gas transmission, making connection with main trunk line of Consolidated Pipe Line Co., running from Texas Panhandle gas field area. One line will be built to plant of Carnegie-Illinois Steel Co., Gary, Ind., where service will be furnished, and other line to a point near Logansport.

**Arkansas-Louisiana Gas Co.**, Shreveport, La., has approved plans for new 12-in welded steel pipe line from gas field areas at Driscoll, Bienville Parish, and Grambling, Lincoln Parish, to connection with main trunk line for natural gas transmission, about 17 miles in all. Cost close to $200,000 with booster stations.

**Western Gas Co.**, El Paso, Tex., will begin work soon on 8-in. welded steel pipe line from Ajo to Phoenix, Ariz., about 80 miles, for natural gas transmission a compressor plant for booster service will be built near Douglas, Ariz. Plans are maturing also for 16-in. welded steel pipe line from gas field near Jal, N. M., to El Paso, for gas transmission. Entire project will cost close to $1,000,000.

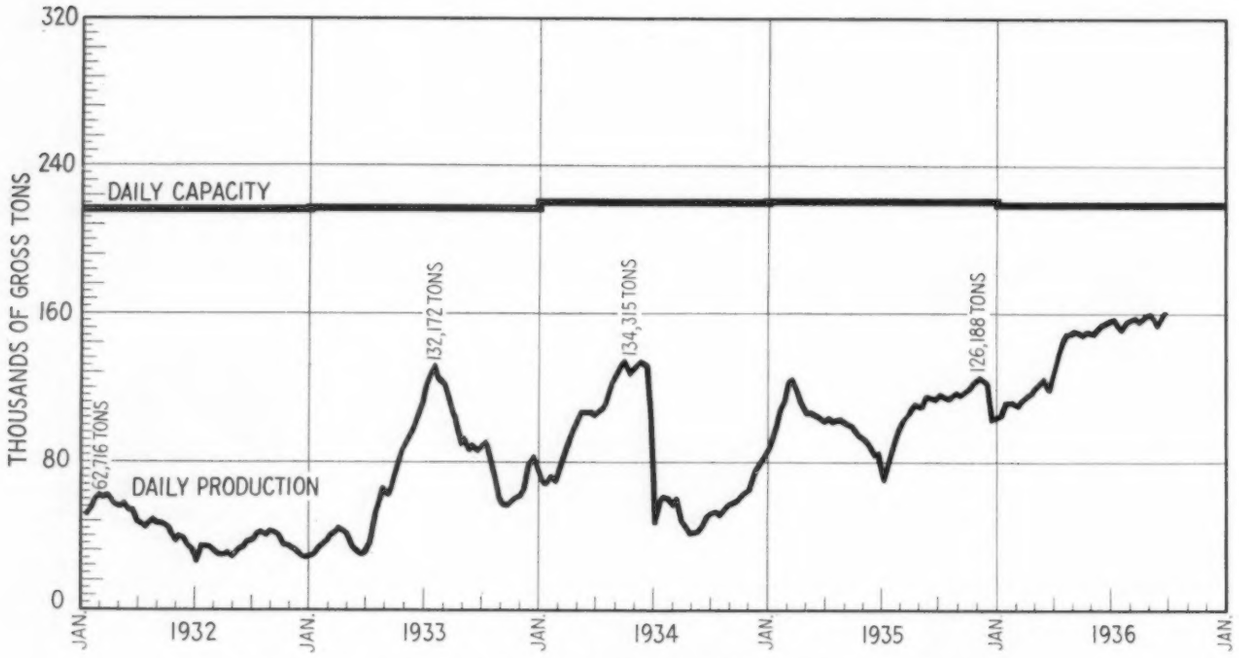
**Southwest Welding & Mfg. Co.**, Alhambra, Cal., has contract from Bureau of Reclamation, Denver, for steel pipe and accessories for sludge disposal on All-American Canal, at $69,250 (Specifications 690).

**Grays Harbor Pulp & Paper Co.**, Hoquiam, Wash., in cooperation with city water departments at Hoquiam and Aberdeen, Wash., plans 52-in. steel pipe line from water station of Lower Wynooche industrial water system to pulp and paper mill at East Hoquiam, for increased water supply. Cost about $270,000. Municipalities will build steel pipe line to water station noted, financing to be arranged through bond issue. Completion is scheduled not later than Feb. 1, 1937, when supply will be required at pulp mill, where expansion is under way.

# STEEL INGOT PRODUCTION

Daily Tonnage of Bessemer and Open-Hearth Steel Ingots Produced by Weeks, 1932-1936

| Current Week | Last Week | Weeks Ended Oct. 5, 1935 | Oct. 6, 1934 | Oct. 7, 1933 | Oct. 8, 1932 |
|---|---|---|---|---|---|
| 164,605 | 161,312 | 116,225 | 52,845 | 88,837 | 38,927 |




Figures for the current week are not indicated on the chart until the following week.

## STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

| District | Current Week | Last Week | Weeks Ended Sept. 5, 1936 | Oct. 5, 1935 | Oct. 6, 1934 |
|---|---|---|---|---|---|
| Pittsburgh | 74.0 | 72.0 | 69.0 | 46.0 | 16.0 |
| Chicago | 74.0 | 73.5 | 73.0 | 60.0 | 26.0 |
| Valleys | 82.0 | 76.0 | 76.0 | 55.0 | 26.0 |
| Philadelphia | 55.0 | 56.0 | 55.0 | 40.0 | 20.0 |
| Cleveland | 80.0 | 74.0 | 78.0 | 59.0 | 21.0 |
| Buffalo | 79.0 | 79.0 | 74.0 | 41.0 | 24.0 |
| Wheeling | 96.0 | 95.0 | 96.0 | 80.0 | 31.0 |
| Southern | 60.5 | 60.5 | 60.5 | 54.0 | 25.0 |
| Ohio River | 92.0 | 85.0 | 89.0 | 82.0 | 34.0 |
| Western | 70.0 | 70.0 | 70.0 | 35.0 | 15.0 |
| St. Louis | 73.5 | 75.0 | 71.0 | 46.0 | 25.0 |
| Detroit | 95.0 | 100.0 | 100.0 | 90.0 | 76.0 |
| Eastern | 90.0 | 90.0 | 90.0 | 35.0 | 20.0 |
| Aggregate | 75.0 | 73.5 | 72.0 | 52.5 | 24.0 |
| Average Year to Date | 64.6 | 64.3 | 63.7 | 46.6 | 39.7 |

# Weekly Booking of Construction Steel

FROM THE IRON AGE

| | Week Ended Sept. 29, 1936 | Sept. 22, 1936 | Sept. 1, 1936 | Oct. 1, 1935 | Year to Date 1936 | 1935 |
|---|---|---|---|---|---|---|
| Fabricated structural steel awards | 20,450 | 9,450 | 11,265 | 17,025 | 830,930 | 585,185 |
| Fabricated plate awards | 1,790 | 1,035 | 210 | 4,200 | 169,175 | 112,885 |
| Steel sheet piling awards | 0 | 1,835 | 695 | 3,750 | 42,175 | 50,710 |
| Reinforcing bar awards | 4,610 | 9,800 | 3,315 | 5,250 | 274,375 | 249.075 |
| Total Lettings of Construction Steel | 26,850 | 22,120 | 15,485 | 30,225 | 1,316,655 | 997,855 |

# . . . SUMMARY OF THE WEEK. . . .

***. . . Ingot output for country rises to 75%, highest since spring of 1930.***

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***. . . Heavy buying of sheets, bars and wire products stimulates production.***

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***. . . Wire products advanced $2 and $3; steel scrap softens in some markets.***

STEEL companies booked from 25 to 50 per cent more tonnage in September than in August, establishing the past month as possibly the best of the year. Production schedules have been stepped up in nearly all districts, the average for the country being estimated at 75 per cent, highest since the spring of 1930. Sharp gains in output have occurred in the Cleveland-Lorain district and at Pittsburgh and Youngstown.

Large bookings of sheets, with the automobile industry again a leading buyer, have placed sheet mills in virtually a sold-up condition for the fourth quarter. On some grades deliveries now quoted extend into December, and automobile companies have made reservations for January rolling, with price in effect at that time to govern. Some mills are out of the market on light gage hot-rolled annealed sheets for the fourth quarter and are turning down proffered business. Hot-rolled bars have also been in large demand. Some of the buying of these products has been to escape the $2 a ton price advance in effect Oct. 1, but a good deal of tonnage has also been taken at the new quotations.

In addition to an active domestic business, mills are enjoying a spurt in export demand, which has been brought about largely because of the inability of British and German mills to make deliveries short of three months or more. Business has come not only from our usual sources of export trade—South America and Central America—but also in increasing amounts from European countries. American export prices for bars, shapes and plates have been increased and are now $4 a ton above quotations ruling early in the year. Sheets are being sold in some foreign markets at full domestic prices, plus freight and other charges.

WITH increasing business from nearly all sources, excepting possibly the construction field, steel mills expect continued difficulties in satisfying customers on deliveries. The situation would be further complicated by freight car shortages, which are likely if carloadings, now approaching 800,000 a week, should climb much higher.

A factor that has strongly influenced steel buying in the past few weeks is a more widespread realization among users of the sold-up condition of the mills and the fact that steel will not be so easy to obtain within reasonable time as has been the case in recent years.

Prospects for further gains in steel business for the new quarter rest largely with the automobile industry and the railroads. Motor car manufacturers are expected to reach the peak of their buying of some products by mid-October, though they have pretty well covered on sheets owing to the delivery situation. Railroads are coming closer to issuance of inquiries for cars and locomotives, and rail buying at present prices, which expire Oct. 31, is expected to increase shortly. The Chicago & Eastern Illinois is in the market for 500 freight cars, and several other Western roads are working on requirements of 300 to 2000 cars each.

BELATED announcement of fourth quarter prices on wire products establishes advances of $2 a ton on wire rods and plain wire and $3 a ton on nails and other merchant wire products. The base sizes of wire rods are changed from Nos. 4 and 5 to No. 5 to 15/32 in., inclusive, and the new price is $40, Pittsburgh. With these changes on wire products and the advances recently announced on certain other products, all of which go into effect Oct. 1, THE IRON AGE composite price for finished steel is advanced in this issue to 2.197c. a lb., a gain of $2.26 a ton over the low of this year and the highest average level since April, 1934.

Steel scrap has been coming out more freely at recent high prices, and prices have declined 50c. a ton at Cleveland and Youngstown, with an easier situation in evidence in other markets. However, THE IRON AGE composite price, based on Pittsburgh, Chicago and Philadelphia quotations, is unchanged at $16.75. Lake Superior charcoal pig iron has been advanced 50c. a ton, but this grade does not enter into THE IRON AGE composite price, which is unchanged. Beehive foundry coke has advanced 25c. a ton to $4.25.

# . . . PITTSBURGH . . .

***. . . Ingot output rises to 70%, highest since 1930.***

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***. . . Delivery situation promises to be more acute in fourth quarter.***

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***. . . Wire products advanced as of Oct. 1; steel scrap market softens.***

PITTSBURGH, Sept. 29.—Reflecting heavy steel specifications placed over the past few weeks, ingot output in the Pittsburgh district is up two points to 74 per cent of capacity, the highest rate since 1930. Production in the Wheeling district has moved up one point to 96 per cent. The attempt to cover at present prices on those items which have been increased for the fourth quarter is not the only reason for heavy bookings being placed at this time. Consumers have awakened to the fact that they must anticipate their future needs in order to get delivery. A large percentage of steel products being ordered at this time will go into immediate consumption by the time shipment is made.

Current demand for hot-rolled bars, hot-rolled annealed sheets, strip, and wire products is extremely heavy. Some mills have turned down orders for sheets and are already realizing the new prices.

Wire prices for the fourth quarter have been announced and reflect an increase of $2 a ton on rods, $3 a ton on merchant wire items and $2 a ton on manufacturers' wire. Increased prices were anticipated by the trade, which began to order heavily a few weeks ago. The new quotations are effective Oct. 1, while all material booked at third quarter prices is scheduled for shipment by Oct. 15.

Specifications for heavy shapes have eased off slightly, but are still holding up well in view of the fact that no increase in price was announced for fourth quarter. Plate orders, on the other hand, are at recent levels and some mills in this district are still quoting five to seven weeks' delivery. Backlogs on hot-rolled bars are increasing daily and deliveries are now running from 30 to 40 days. Most of this improvement in bar specifications is without benefit of heavy automobile tonnages, which are expected around the middle of October.

Present indications point to a recurrence of delivery and production problems prevalent during July.

Bookings of sheets and strip steel show further increases this week. Tin plate production remains at 90 per cent. Practically all new specifications are coming for general line cans.

As present quotations on standard rails and splice bars are good only to Oct. 31 for delivery through the remainder of the year, it seems fairly certain that an increase on these items will be announced some time after Nov. 1.

Over the past week the scrap market has shown a slightly softer tone, but heavy melting steel remains quotable at $18 to $18.50.

### *Pig Iron*

Total tonnages being ordered continue to increase. Consumers are more specific about their commitments and in some cases are breaking away from hand-to-mouth buying policies. This trend is due to the possibility of higher prices late in the year. Should such a rise materialize, shipments to those protected by contracts for the fourth quarter will be extremely heavy. The Edgar Thompson works of Carnegie-Illinois Steel Corp. has blown in another blast furnace which will produce ferromanganese. The Jones & Laughlin Steel Corp. will blow in its only idle stack as soon as repairs to by-product ovens are completed, which will be within the next week or two. It is now operating 10 blast furnaces out of 11.

### *Semi-Finished Steel*

Specifications continue to show an increase. Some producers are turning down orders owing to their own position with respect to raw steel requirements. Heavy volume of new sheet business is being reflected in a large movement of sheet bars to non-integrated mills.

### *Bolts, Nuts and Rivets*

Specifications have shown a further slight improvement over the past week, but aggregate bookings are not quite up to the level for the same period last month. Railroad car repair programs and requirements for car builders continue to be responsible for a fair share of the total business. Miscellaneous orders have picked up slightly over the past few weeks and, while no heavy automotive tonnages have been placed, there is a slight improvement in that direction.

### *Bars*

Demand has again moved upward. All bookings at third quarter prices are for shipment at the mill's convenience. Backlogs have increased and promised deliveries are from 30 to 40 days. While much of the tonnage being booked today is to take advantage of third quarter prices, this material, on account of delayed deliveries, will be ready for immediate consumption by the time shipment is made. There has been some effort on the part of consumers to get protection far into the fourth quarter at the lower prices, but apparently without success. New prices will be fully effective Oct. 1. Any extension on delivery of third quarter price material will be entirely due to production problems at the mill. Meanwhile, implement makers have been increasing specifications and a substantial amount of hot rolled bars is moving to jobbers. Automotive tonnages, while larger than a few weeks ago, are still below the expectations of producers. Present indications are that heavy automotive tonnages will not reach the mills before the middle of October.

### *Cold-Finished Bars*

Demand has again moved slightly upward this week. The amount of orders booked, however, is not as great as producers had expected, which gives rise to the assumption that considerable tonnage will be placed next month at the new prices. Automobile manufacturers have been unable to cover much of their future requirements at third quarter prices and are not

# A Comparison of Prices

## Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

### Rails and Semi-finished Steel

| *Per Gross Ton:* | Sept. 29, 1936 | Sept. 22, 1936 | Sept. 1, 1936 | Oct. 1, 1935 |
|---|---|---|---|---|
| Rails, heavy, at mill | $36.37½ | $36.37½ | $36.37½ | $36.37½ |
| Light rails, Pittsburgh | 35.00 | 35.00 | 35.00 | 35.00 |
| Rerolling billets, Pittsburgh | **32.00** | 30.00 | 30.00 | 27.00 |
| Sheet bars, Pittsburgh | **32.00** | 30.00 | 30.00 | 28.00 |
| Slabs, Pittsburgh | **32.00** | 30.00 | 30.00 | 27.00 |
| Forging billets, Pittsburgh | **39.00** | 37.00 | 37.00 | 35.00 |
| Wire rods, No. 5 to 15/32" incl., Pittsburgh | **40.00** | 38.00 | 38.00 | 38.00 |
| | Cents | Cents | Cents | Cents |
| Skelp, grvd. steel, P'gh, lb. | 1.80 | 1.80 | 1.80 | 1.70 |

### Finished Steel

| *Per Lb.:* | Cents | Cents | Cents | Cents |
|---|---|---|---|---|
| Bars, Pittsburgh | **2.05** | 1.95 | 1.95 | 1.85 |
| Bars, Chicago | **2.10** | 2.00 | 2.00 | 1.90 |
| Bars, Cleveland | **2.10** | 2.00 | 2.00 | 1.90 |
| Bars, New York | **2.40** | 2.30 | 2.30 | 2.20 |
| Plates, Pittsburgh | 1.90 | 1.90 | 1.90 | 1.80 |
| Plates, Chicago | 1.95 | 1.95 | 1.95 | 1.85 |
| Plates, New York | 2.19 | 2.19 | 2.19 | 2.09 |
| Structural shapes, Pittsburgh | 1.90 | 1.90 | 1.90 | 1.80 |
| Structural shapes, Chicago | 1.95 | 1.95 | 1.95 | 1.85 |
| Structural shapes, New York | 2.16¼ | 2.16¼ | 2.16¼ | 2.06¼ |
| Cold-finished bars, Pittsburgh | **2.35** | 2.25 | 2.25 | 1.95 |
| Hot-rolled strips, Pittsburgh | 1.95 | 1.95 | 1.95 | 1.85 |
| Cold-rolled strips, Pittsburgh | 2.60 | 2.60 | 2.60 | 2.60 |
| Hot-rolled annealed sheets, No. 24, Pittsburgh | **2.60** | 2.50 | 2.50 | 2.40 |
| Hot-rolled annealed sheets, No. 24, Gary | **2.70** | 2.60 | 2.60 | 2.50 |
| Sheets, galv., No. 24, P'gh | 3.20 | 3.20 | 3.20 | 3.10 |
| Sheets, galv., No. 24, Gary | 3.30 | 3.30 | 3.30 | 3.20 |
| Hot-rolled sheets, No. 10, Pittsburgh | 1.95 | 1.95 | 1.95 | 1.85 |
| Hot-rolled sheets, No. 10, Gary | 2.05 | 2.05 | 2.05 | 1.95 |
| Cold-rolled sheets No. 20, Pittsburgh | 3.05 | 3.05 | 3.05 | 2.95 |
| Cold-rolled sheets No. 20, Gary | 3.15 | 3.15 | 3.15 | 3.05 |
| Wire nails, Pittsburgh | **2.05** | 1.90 | 2.10 | 2.40 |
| Wire nails, Chicago dist. mill | **2.10** | 1.95 | 2.15 | 2.45 |
| Plain wire, Pittsburgh | **2.50** | 2.40 | 2.10 | 2.30 |
| Plain wire, Chicago dist. mill | **2.55** | 2.45 | 2.45 | 2.35 |
| Barbed wire, galv., Pittsburgh | **2.55** | 2.40 | 2.60 | 2.80 |
| Barbed wire, galv., Chicago dist. mill | **2.60** | 2.45 | 2.65 | 2.85 |
| Tin plate, 100-lb. box, P'gh. | $5.25 | $5.25 | $5.25 | $5.25 |

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

### Pig Iron

| *Per Gross Ton:* | Sept. 29, 1936 | Sept. 22, 1936 | Sept. 1, 1936 | Oct. 1, 1935 |
|---|---|---|---|---|
| No. 2 fdy., Philadelphia | $21.3132 | $21.3132 | $21.3132 | $20.3132 |
| No. 2, Valley furnace | 19.50 | 19.50 | 19.50 | 18.50 |
| No. 2, Southern Cin'ti | 20.2007 | 20.2007 | 20.2007 | 19.2007 |
| No. 2, Birmingham† | 15.88 | 15.88 | 15.88 | 14.50 |
| No. 2, foundry, Chicago* | 19.50 | 19.50 | 19.50 | 18.50 |
| Basic, del'd eastern Pa. | 20.8132 | 20.8132 | 20.8132 | 19.8132 |
| Basic, Valley furnace | 19.00 | 19.00 | 19.00 | 18.00 |
| Malleable, Chicago* | 19.50 | 19.50 | 19.50 | 18.50 |
| Malleable, Valley | 19.50 | 19.50 | 19.50 | 18.50 |
| L. S. charcoal, Chicago | **25.7528** | 25.2528 | 25.2528 | 24.7528 |
| Ferromanganese seab'd carlots | 75.00 | 75.00 | 75.00 | 85.00 |

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 0.70 per cent or higher.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

### Scrap

| *Per Gross Ton:* | | | | |
|---|---|---|---|---|
| Heavy melting steel, P'gh | $18.25 | $18.25 | $17.25 | $13.50 |
| Heavy melting steel, Phila. | 15.75 | 15.75 | 15.00 | 12.50 |
| Heavy melting steel, Ch'go | 16.25 | 16.25 | 15.75 | 12.50 |
| Carwheels, Chicago | **16.50** | 16.00 | 15.50 | 12.75 |
| Carwheels, Philadelphia | 16.75 | 16.75 | 16.25 | 11.75 |
| No. 1 cast, Pittsburgh | 16.25 | 16.25 | 15.75 | 14.25 |
| No. 1 cast, Philadelphia | 16.75 | 16.75 | 15.75 | 11.75 |
| No. 1 cast, Ch'go (net ton) | **14.00** | 13.50 | 13.50 | 11.25 |
| No. 1 RR. wrot., Phila. | 15.75 | 15.75 | 14.75 | 12.25 |
| No. 1 RR. wrot., Ch'go (net) | 14.25 | 14.25 | 13.75 | 9.50 |

### Coke, Connellsville

| *Per Net Ton at Oven:* | | | | |
|---|---|---|---|---|
| Furnace coke, prompt | $3.75 | $3.75 | $3.65 | $3.25 |
| Foundry coke, prompt | **4.25** | 4.00 | 4.00 | 4.00 |

### Metals

| *Per Lb. to Large Buyers:* | Cents | Cents | Cents | Cents |
|---|---|---|---|---|
| Electrolytic copper, Conn. | 9.75 | 9.75 | 9.75 | 8.75 |
| Lake copper, New York | 9.87½ | 9.87½ | 9.87½ | 9.12½ |
| Tin (Straits), New York | **45.40** | 45.00 | 43.12½ | 50.15 |
| Zinc, East St. Louis | 4.85 | 4.85 | 4.85 | 4.75 |
| Zinc, New York | 5.22½ | 5.22½ | 5.22½ | 5.12½ |
| Lead, St. Louis | 4.45 | 4.45 | 4.45 | 4.35 |
| Lead, New York | 4.60 | 4.60 | 4.60 | 4.50 |
| Antimony (Asiatic), N. Y. | 12.50 | 12.50 | 12.50 | 14.25 |

# The Iron Age Composite Prices

| | Finished Steel | Pig Iron | Steel Scrap |
|---|---|---|---|
| Sept. 29, 1936 | 2.197c. a Lb. | $18.73 a Gross Ton | $16.75 a Gross Ton |
| One week ago | 2.159c. | 18.73 | 16.75 |
| One month ago | 2.159c. | 18.73 | 16.00 |
| One year ago | 2.130c. | 17.84 | 12.83 |
| | Based on steel bars, beams, tank plates, wire rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output. | Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati. | Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago. |

| | Finished Steel HIGH | Finished Steel LOW | Pig Iron HIGH | Pig Iron LOW | Steel Scrap HIGH | Steel Scrap LOW |
|---|---|---|---|---|---|---|
| 1936 | 2.197c., Sept. 29 | 2.084c., Mar. 10 | $18.84, Jan. 7 | $18.73, Aug. 11 | $16.75, Sept. 22 | $12.67, June 9 |
| 1935 | 2.130c., Oct. 1 | 2.124c., Jan. 8 | 18.84, Nov. 5 | 17.83, May 14 | 13.42, Dec. 10 | 10.33, April 23 |
| 1934 | 2.199c., April 24 | 2.008c., Jan. 2 | 17.90, May 1 | 16.90, Jan. 27 | 13.00, Mar. 13 | 9.50, Sept. 25 |
| 1933 | 2.015c., Oct. 3 | 1.867c., April 18 | 16.90, Dec. 5 | 13.56, Jan. 3 | 12.25, Aug. 8 | 6.75, Jan. 3 |
| 1932 | 1.977c., Oct. 4 | 1.926c., Feb. 2 | 14.81, Jan. 5 | 13.56, Dec. 6 | 8.50, Jan. 12 | 6.43, July 5 |
| 1931 | 2.037c., Jan. 13 | 1.945c., Dec. 29 | 15.90, Jan. 6 | 14.79, Dec. 15 | 11.33, Jan. 6 | 8.50, Dec. 29 |
| 1930 | 2.273c., Jan. 7 | 2.018c., Dec. 9 | 18.21, Jan. 7 | 15.90, Dec. 16 | 15.00, Feb. 18 | 11.25, Dec. 9 |
| 1929 | 2.317c., April 2 | 2.273c., Oct. 29 | 18.71, May 14 | 18.21, Dec. 17 | 17.58, Jan. 29 | 14.08, Dec. 3 |
| 1928 | 2.286c., Dec. 11 | 2.217c., July 17 | 18.59, Nov. 27 | 17.04, July 24 | 16.50, Dec. 31 | 13.08, July 2 |
| 1927 | 2.402c., Jan. 4 | 2.212c., Nov. 1 | 19.71, Jan. 4 | 17.54, Nov. 1 | 15.25, Jan. 11 | 13.08, Nov. 22 |

expected to be in the market for heavy volume until the middle of October or later. Meanwhile, miscellaneous buyers continue to increase the amount of steel taken. Especially is this true of jobbers and electrical appliance manufacturers.

### *Shapes and Plates*

Specifications for heavy shapes have eased off further, although bookings for plates continue at recent levels. Some plate mills in this district are still four to six weeks behind on deliveries. Much of the plate business is coming from tank and barge manufacturers, with a fair proportion being ordered by miscellaneous sources. American Bridge Co. has been awarded the contract for the plaza construction at the midtown Hudson tunnel, Weehawken, N. J., involving 800 tons.

### *Steel Sheet Piling*

Engineering Construction Corp., Alton, Ill., was a low bidder on lock No. 26, Mississippi River project involving approximately 2000 tons of steel sheet piling. A. H. Hazell, Inc., New York, is low bidder on the bulkhead to be constructed at Sheepshead Bay, N. Y., calling for 816 tons. No large steel sheet piling awards have been made during the past week, although several are in the final stage. Considerable piling is moving into jobs requiring less than 100 tons.

### *Strip Steel*

Further increases have been noted this week and, as a result, backlogs are larger. Main support is coming from miscellaneous buyers. Deliveries on hot-rolled strip are running from three to four weeks, with cold-rolled at five to six weeks. Automotive orders are slowly increasing, but are below expectations of producers. With the present volume of business coming from the remainder of the trade, it would appear that acute delivery problems will materialize when heavy tonnages are booked by motor car manufacturers. Meanwhile, electrical appliance, stove, and office equipment manufacturers are specifying freely. An increase in bookings by pole line hardware interests is noted.

### *Tin Plate*

Operations continue at 90 per cent. Last minute releases by can makers for clean-up on fruit and vegetable packs have been heavy during the past week. While packers' specifications on the whole have eased off further, good bookings for general line cans maintain a satisfactory volume of business. Incidentally, releases on tin plate held by producers have been greater than was expected a few months ago. Some reduction in the operating rate is expected in the near future.

### *Tubular Products*

Following a slight lull a few weeks ago, specifications for standard pipe from jobbers have picked up. Although not spectacular, the long, steady improvement in home building and plant renovation has resulted in an increasingly better movement of standard pipe from jobbers to consumers. It is expected that this improvement will continue. Meanwhile, there has been no change in bookings for oil country goods, but both merchant and railroad boiler tubes have shown further slight improvement. Interest in line pipe activity has revived since the Cabot project, involving a 14-in. pipe line to Rochester, N. Y., has been approved by the New York State Public Utilities Commission. It is expected that the award will be made in the near future.

### *Reinforcing Steel*

As yet no formal announcement has been made on fourth quarter prices, although it is expected momentarily. It is a foregone conclusion that there will be no change from third quarter quotations. The price situation continues to show a firmer tone. No large projects have been awarded in the past week. Mills are actively engaged in working off old orders. Heavy specifications for hot-rolled bars will, in some measure, affect the delivery on reinforcing bars owing to production difficulties.

### *Wire Products*

A leading producer has announced prices for fourth quarter delivery, effective Oct. 1. Major changes, reflecting a $2 a ton increase on rods, a $3 a ton increase on nails and a $2 increase on bright wire, are as follows: Wire rods, No. 5 gage to 15/32 in. inclusive, $40 a ton; over 15/32 in. to and including 47/64 in., $42 a ton; bright wire, 2.50c. per lb.; spring wire unchanged at 3.05c. per lb.; nails, $2.05 base per keg; annealed fence wire, 2.80c. per lb.; galvanized fence wire, 3.15c. per lb.; polished staples, 2.75c. per lb.; galvanized staples, 3c. per lb.; galvanized barbed wire, 2.55c. per lb. Woven wire fence will be quoted at column 60, an advance of $3 a ton, while single loop bale ties will be quoted at column 52, up $1 a ton. All of the above prices are f.o.b. Pittsburgh, carload lots. Less-than-carload shipments will be 20c. per 100 lb. higher. Anticipating a price rise, consumers have been specifying heavily for both manufacturing wire and merchant wire products, and as a result, aggregate bookings this week are up sharply over a week ago. All material ordered at recent prices must be shipped by Oct. 15, and the new prices go into effect on all business taken on and after Oct. 1.

### *Sheets*

Aggregate bookings the past week almost reached the level of the week before, which was the best in several months. Orders are well diversified, with a large tonnage being placed by automobile manufacturers. Backlogs have been increased in this district, and deliveries, depending on the type of sheets, are running from four to eight weeks. At the rate new business is being received, the delivery situation will continue to grow tighter. Some producers have already realized new prices on those items which were increased for fourth quarter delivery. While a large percentage of bookings placed during the past few weeks was the result of customers anticipating their needs, most of this material will go into immediate consumption by the time shipment is made. This would seem to preclude any sharp leveling off of orders after the first of the month.

### *Coal and Coke*

The recent flurry in beehive coke production continues. While much attention has been given this reawakening, there is little chance that beehive coke will anywhere near approximate the importance it held several years ago. Much of the present business taken by beehive producers is to fill in needs until such time as by-product ovens, long unused, are renovated and repaired. Extensive repairs on by-product equipment are being made at the present time by steel producers in this district, and merchant by-product coke manufacturers are doing likewise. Further requirements for beehive coke will materialize this fall, especially for the domestic trade. Some producers who formerly supplied domestic needs have turned their attention to the more active furnace and foundry beehive coke markets. The present tight situation in furnace coke is resulting in some changes being made in the destination of the large beehive coke contract placed recently. Beehive furnace coke, f.o.b. Connellsville, prompt, is firmly quoted at $3.75 to $4 a ton. Foundry beehive coke, f.o.b. Connellsville, prompt, is up 25c. quotable at $4 to $5.75, which includes premium grades.

# . . . . CHICAGO . . . .

***. . . Ingot output lifted to 74% as automotive orders gain.***

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***. . . Higher prices for wire products announced for fourth quarter.***

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***. . . Chicago & Eastern Illinois inquires for 500 freight cars.***

CHICAGO, Sept. 29.—Ingot output continues to push forward, having reached 74 per cent of capacity, a gain of one-half point. There is noticeable pressure from automobile plants, which, though having die and tool troubles, are counted on to increase requirements to a peak expected about mid-October. Structural awards are more numerous and in better volume and the inquiry list is impressive. There is a brighter tone to the railroad market as the Chicago & Eastern Illinois comes in for 500 cars. Miscellaneous rail purchases total 3000 tons.

Announcement of wire prices for the fourth quarter show advances of $2 to $3 a ton. Quantity differentials are being applied to some wire products and this practice probably will be broadened when first quarter prices are established.

Farm implement manufacturers see brighter skies ahead, and it is not uncommon to find people in that trade who foresee a shortage of farm equipment in the near future.

The scrap market remains firm, with some grades of specialties still tending to move upward in price.

### *Pig Iron*

Fourth quarter contracts already added to producers' books are by far the heaviest of the year and there is still some heavy buying to be done. There is a hint of some speculation as many buyers are becoming more and more convinced that prices will be advanced for the first quarter, if not before. Shipments are growing as automobile foundries swing into line with heavier melts.

### *Coke*

October delivery prices are being fixed at $9 a ton, Chicago ovens, the same quotation that has prevailed in the month now ending. Shipments are heavy and the make of foundry coke no more than balances use.

### *Rails*

Miscellaneous small lot orders total 3000 tons and more of this kind of business is in sight. Large contract business is lagging, but the impression exists throughout the trade that the underlying reason is that price policies are not established beyond producers' announcements that present quotations are good only to Nov. 1. Adoption of higher prices would drive in a large volume of business, as it is known that railroads have been making careful studies of future needs and will be prepared to act on short notice. Miscellaneous accessory business is light, but shipments are heavy against contracts. Present rail rolling schedules are well arranged to the end of next month.

### *Sheets*

Deliveries have been lengthened. Promises of eight to 12 weeks are common; in fact, some mills are filled for the fourth quarter and can only take such small tonnages as can be sandwiched in here and there on rolling schedules that are all but filled. Automobile use is heavy, though somewhat handicapped by tool and die troubles. Country business is excellent and little is now heard of the effects of the drought.

### *Bars*

Consumption by automobile and parts makers is growing rapidly and this upward drift is expected to continue for about three weeks. Forgers of crankshafts and the like are rapidly expanding their use of bar mill products. Tractor production is not giving ground and output is well established above normal for this time of year. Farm implement plants continue to gain ground on tillage, plows and the lighter types of equipment. Their optimism is again growing out of bounds and there are some who predict a shortage of farm machinery before many months have gone by. Road machinery manufacturers continue to hold to the high and even production which they have maintained for months.

### *Structural Material*

Differences between estimates and bids for the South Ashland Avenue (Chicago) bridge have been settled and 2200 tons of steel has been ordered. Other awards, totaling about 4000 tons, cover almost without exception jobs on which public money is being spent. Fresh inquiries are not impressive, if only the larger ones are taken into consideration. However, there are upward of 100 new projects which call for a total of 7500 tons of steel.

### *Plates*

The Chicago & Eastern Illinois is coming into the market for 500 freight cars and other projects of from 300 to 2000 units each are taking shape. The Birmingham Southern has ordered five Diesel-electric locomotives and the Cincinnati, New Orleans & Texas Pacific will buy 10 dump cars. The best source of plate business is railroad equipment, pipe line and large tank projects being scarce. Miscellaneous orders are steady.

### *Warehouse Business*

Prices are being marked to conform to recent advances made by mills. Revised quotations cover soft steel bars, cold-finished bars, track spikes, track bolts and hot-rolled annealed sheets.

### *Wire Products*

Higher prices are being announced for fourth quarter deliveries. The lead taken by some of the heavy tonnage steel producers is being followed in that the delivered price system is being used. For delivery in the Chicago area 60c. a ton switching charge is being added and at Cleveland and Pittsburgh the added charge is 50c. Bright wire to the manufacturing trade is being marked up to 2.55c. per lb., to which is added 0.3c. for switching, bringing the delivered price to 2.58c. a lb. Nails move up to $2.10 a keg, and fence wire, staples, barbed wire and woven wire fencing all carry higher prices. Heavier shipments are moving to automobile centers and mills

are winding up the month close to the high point reached in July. New prices on rods are $41.60, delivered Chicago, for No. 5 to and including 15/32 in. and $43.60 a gross ton for sizes over 15/32 in. to 47/64 in. Larger sizes are to be sold on the basis of the bar price and card of extras.

### *Cast Iron Pipe*

Chicago has closed for 3000 tons, the division having been made between United States Pipe & Foundry Co. and Lynchburg Foundry Co. Chicago has also ordered 125 tons of offsets. This market is drifting in a narrow channel with business mostly in carlot and smaller size.

### *Reinforcing Bars*

Outstanding among current awards is 1030 tons taken by Truscon Steel Co. for the Outer Drive, Chicago. Private lettings include 100 tons for a Sears, Roebuck & Co. store and 140 tons for a store in Oak Park, Ill. Fresh inquiries are light, but shops are busy and can maintain full output past the middle of October. New lettings do not match shipments, but books are still of such size that fabricators are not worried. Plans known to be in the making promise a substantial tonnage and sellers feel that many of these projects will develop during the fall.

***. . . Pig iron business improving.***

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***. . . Structural fabricating jobs fall off.***

ST. LOUIS, Sept. 29.—Buying of sheets and bars in advance of the price increase effective Oct. 1 has been in fair volume. Business in other lines of finished steel has been not as brisk as in the preceding weeks.

Production in the shops of structural fabricators in the district has fallen off to about 60 per cent of capacity, owing to a lack of large contracts in the last month or so. While there has been a great many alteration jobs, the tonnage has been small, ranging from 5 to 30 tons. Fabricators are awaiting word of projects contemplated by the highway commissions of Missouri and Illinois.

Reinhardt Construction Co. is low on the general contract for a Missouri State hospital building at Nevada, and McDonald Construction is low on a hospital at Fulton, requiring 160 and 150 tons of reinforcing bars, respectively.

Good business and the feeling that prices will advance in line with the advances on steel have stimulated buying of pig iron by district melters. September shipments have been heavy. The melt in the district continues at a high rate.

The Missouri Pacific Railway has been authorized by the Federal Court to buy 2000 tons of 112-lb. rails and the necessary fastenings and accessories to cost $186,000.

***. . . Warehouses increase prices in line with mills.***

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***. . . Tension over dock labor situation hurts trade.***

SAN FRANCISCO, Sept. 28.—Warehouse price advances of from 10c. to 20c. per 100 lb., effective Oct. 1, follow announced fourth quarter mill price increases. In San Francisco the increase is universally 10c. per 100 lb., while at Los Angeles prices rose generally 20c.

The award of two contracts involving 2010 tons of reinforcing bars and 980 tons of structural steel to the Bethlehem Steel Co. was the market feature the past week. One was for the State Livestock Building in San Mateo Co., Cal., requiring 940 tons of bars and 980 tons of shapes. The contract for 1070 tons of bars to be used in the Air Terminal building on Yerba Buena Shoals in the San Francisco Bay was formally awarded to Bethlehem.

Bids will be opened Oct. 15 on from 1600 to 1750 tons of reinforcing steel to be used in the construction of University Mound Reservoir Basin in San Francisco.

At the time of writing no agreement has yet been reached between longshoremen and shipowners to supplant the old agreement expiring Sept. 30. Steel companies generally express the belief that tension resulting from the labor situation is partially to blame for the quiet prevailing in business.

**Charlotte, N. C.,** plans new 30-in. water trunk line, supplementing present 24-in.; also pipe lines for extensions and replacements in water system in different parts of city. New pumping station will be built on Catawba River for increased supply; three 1,000,000-gal. tanks are planned, with extensions in filtration plant and other waterworks installation. Entire project will cost close to $1,000,000. Financing will be arranged through Federal aid. J. B. Marshall is city manager.

**Westernport, Md.,** plans about 10,000 ft. of 10-in. for main water supply, replacing present wood pipe line. Financing has been arranged through Federal aid.

**Avery, Tex.,** closes bids Oct. 5 for 10,700 ft. of 2 to 8-in. for water system; also for 50,000-gal. elevated steel tank and tower, pumping unit and auxiliary equipment. D. C. Walmsley, Thomas Building, Dallas, Tex., is consulting engineer.

**Tulsa, Okla.,** plans early purchase of about 29,000 ft., of 2 to 6-in. for extensions and replacements in water system.

**Oklahoma City, Okla.,** plans about 5½ miles of various sizes for extensions in water system. Enlargement will also be made in filtration plant, including installation of additional equipment. Fund of $130,000 has been secured through Federal aid.

**Safford, Graham County, Ariz.,** plans pipe lines for water system; also other waterworks installation. Fund of $496,000 is being secured through Federal aid.

**Chicago** has awarded 125 tons of offsets to Hansell-Elcock Co.

**Chicago** has divided 3000 tons between United States Pipe & Foundry Co. and Lynchburg Foundry Co.

**Lyndon Station, Wis.,** plans WPA project requiring 8870 ft. of 4, 6 and 8-in., class 150.

**North Hudson, Wis.,** voted at referendum Sept. 15 to build waterworks system costing $50,000.

**Town Preble, Brown County, Wis.,** has authorized bond issue of $100,000 toward cost of $181,000 water system under PWA.

**Fond du Lac, Wis.,** has received approval of PWA grant of $56,073 toward water softening plant costing $124,605.

**Wisconsin Rapids, Wis.,** has applied for PWA grant of $34,278 toward water main extensions to cost $77,175.

**Preble, Wis.,** has approved bond issue of $100,000, to be increased to about $180,000 through Federal aid, for pipe lines for water system and other waterworks installation. H. R. Albert, 101 North Washington Street, Green Bay, Wis., is consulting engineer.

**Oelwein, Iowa,** has secured Federal grant of $21,150, to be increased to $51,000 through municipal financing for pipe lines for water system and other waterworks installation, including 12-in. main line from pumping station to proposed 500,000-gal. elevated steel tank and tower. E. E. Schenk, 132 Lovejoy Street, Waterloo, Iowa, is consulting engineer.

**Ogden, Utah,** has secured fund of $33,750 through Federal aid for pipe line extensions and replacements in water system.

**Oakridge, Ore.,** plans pipe lines for water system. Fund of $25,000 has been secured through Federal aid. P. M. Morse, Court House, Eugene, Ore., is engineer.

**Walnut Creek, Cal.,** will open bids Oct. 7 on 547 tons of 4, 6, 8 and 10-in. for a water project.

# . . . CLEVELAND . . .

***. . . Ingot production increased as business gains substantially.***

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***. . . Heavy volume of orders for bars as new prices take effect.***

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***. . . Sheet mills operating at full capacity with large backlogs.***

CLEVELAND, Sept. 29.—Ingot output took an upward spurt this week, advancing six points to 80 per cent of capacity in the Cleveland-Lorain district and also six points to 82 per cent in the Valley district.

The Sept. 30 dead-line date of taking steel bar business at the third quarter price has had the effect of bringing out a very heavy volume of orders for bars, which included lots up to 1000 tons. The business is coming from all classes of consumers and some of the buying evidently is of a speculative character.

Sheet specifications have been heavy the past week largely in cold-rolled material from the motor car industry and from other consumers who are anxious to get their orders on the mill books for October rolling. There was little business in hot-rolled annealed sheets, on which prices have been advanced, for the reason that mills had previously booked so much tonnage that they had withdrawn from the market. With heavy backlogs, sheet mills are operating on full schedules this week.

Prices on wire products have been established for the fourth quarter at an advance of $3 a ton, restoring the prices in effect before the recent reduction. A $2 a ton advance has been made on wire rods. Manufacturers' wire has been advanced $2 a ton to 2.50c. a lb., Pittsburgh and Cleveland. This represents a definite advance, as the price on this product was not changed when other wire products were reduced. Present prices on spring wire have been reaffirmed.

### *Pig Iron*

Considerable iron still is being sold, although orders are not as heavy as during the early part of the month. Furnaces will start the fourth quarter with probably 25 per cent more iron on their books than they had July 1. Heavier volume is attributed both to improved foundry operations and to the increased use of scrap. While there is talk of a price advance, this so far apparently has not been a factor in stimulating sales. If prices are marked up, it is expected that the advance will be $1 a ton. Shipments this month will show quite a gain over August. The expected increase in shipping orders from the motor car industry has not yet materialized except to a very limited extent.

### *Sheets*

The automotive industry is showing an anxiety to get orders on the mill rolling schedules and demand for sheets from that source has continued heavy, particularly for cold-rolled grades, and some of the mills are now filled up for October shipment for some grades. With others incoming orders are falling a little behind shipments, permitting them to reduce backlogs. New business in sizable lots has come from some of the stamping plants in this territory that have secured releases for motor car parts and are getting these parts under production. The local Fisher Body plant increased operations this week after being on a 50 per cent schedule for the past two weeks and expects to get up to near capacity shortly. Refrigerator manufacturers have purchased some sheets for new models, the manufacture of which they will start in a short time. Quite a few orders for hot-rolled annealed sheets have been taken at the new fourth quarter prices.

### *Strip Steel*

Leading automobile parts makers in the Indiana territory placed

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INDUSTRIAL and ORNAMENTAL
H & K industrial perforations embrace a range of sizes and shapes intended to meet the most exacting requirements of all industries.
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considerable tonnage of both hot and cold-rolled strip the past week for October shipment and issued releases against new orders. Mills have good backlogs and are not catching up on deliveries.

### *Bolts, Nuts and Rivets*

Bolt and nut shipments in September will be about 10 per cent better and sales will show a 20 per cent gain over August. Heavy releases are expected early this month from automobile manufacturers who have placed liberal orders. New demand is good from miscellaneous consumers and from jobbers, but only fair from railroads. Prices are inclined to be firmer than recently, although concessions have not entirely disappeared. Demand for rivets, while still fair, has slackened because the market at present does not have the stimulus of orders from the railroad field for use in car building.

### *Bars, Plates and Shapes*

As the dead-line date approached for entering orders for steel bars at the current price, the volume of new business sharply increased. These orders are being taken at the mills' convenience for shipment before Nov. 1. The new 2.10c., Cleveland, price becomes effective Oct. 1. Some consumers have enough orders to keep their bar mills fully employed through October. Operations of forge shops have improved, although releases from motor car manufacturers are still rather light. In the construction field the State Highway Department has awarded 615 tons for a Wood County bridge and took bids today for two other bridges requiring 700 tons. New structural inquiry is light.

### *Wire Rods*

A $2 a ton price advance has been made on wire rods. Two classifications that were in effect during the code have replaced the three more recent wire rod classifications. The new prices are $40, Pittsburgh and Cleveland, for sizes No. 5 to 15/32 in. and $42 for over 15/32 in. to 47/64 in.

### *Wire Products*

Nails and other wire products have been advanced $3 a ton for the fourth quarter, eliminating reductions that were made recently and establishing nails at $2.05 per keg, Cleveland. No change is made on fence posts.

### *Warehouse Business*

A $2 a ton advance on hot-rolled and cold-finished steel bars to correspond with the mill advance has been announced effective Oct. 1. New extras corresponding with the change in mill extras are also being placed in effect on heavy hot-rolled sheets. Jobbers have advanced wire products $3 a ton.

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## REINFORCING STEEL

***. . . Awards of 4610 tons —5400 tons in new projects.***

#### AWARDS

**Peabody, Mass.,** 100 tons, State bridge, to Concrete Steel Co.

**New York,** 340 tons, section 8, Sixth Avenue subway construction, to Bethlehem Steel Co.

**Chicago,** 1030 tons, Outer Drive, to Truscon Steel Co.

**Chicago,** 100 tons, Sears Roebuck building, to Bethlehem Steel Co.

**Gary, Ind.,** 175 tons, post office, to Calumet Steel Co.

**Oak Park, Ill.,** 140 tons, Goldberg store, to Joseph T. Ryerson & Son, Inc.

**San Francisco,** 941 tons, State livestock building in San Mateo County, to Bethlehem Steel Co.

**San Francisco,** 1070 tons, air terminal on Yerba Buena Shoals, to Bethlehem Steel Co.

**Los Angeles,** 120 tons, Commonwealth school auditorium, to Concrete Engineering Co.

**Sacramento, Cal.,** 394 tons, high school machinery building, to Concrete Engineering Co.

**Mare Island, Cal.,** 200 tons, Navy construction, to Soule Steel Co.

#### NEW REINFORCING BAR PROJECTS

**Attleboro-North Attleboro-Plainville,** 200 tons, State road.

**New York,** 359 tons, Treasury Department work; bids taken Sept. 29.

**Philadelphia,** 700 tons, warehouse for North American Warehousing Co.; bids Oct. 1.

**Buffalo,** 1300 tons, Tifft Street viaduct; John W. Cowper, Inc., low bidder.

**Milwaukee,** 185 tons, United States Engineer Office; bids close Oct. 2.

**Nevada, Mo.,** 160 tons, State hospital building; Reinhardt Construction Co., St. Louis, low bidder on general contract.

**Fulton, Mo.,** 150 tons, hospital for criminal insane; McDonald Construction Co., St. Louis, low bidder on general contract.

**San Francisco,** 1600 or 1750 tons, under two schedules for construction of University Mound reservoir basin; bids Oct. 15.

**San Francisco,** 600 tons, replacement of Pier 9; bids Oct. 8.

**Los Angeles,** 400 tons, Verdugo Road junior high school; bids Oct. 14.

**Los Angeles,** 319 tons, Berendo junior high school; W. W. Petteg, general contractor.

**Los Angeles,** 610 tons, Hollenbeck junior high school; Herbert M. Baruch Corp., general contractors.

## RAILROAD BUYING

**Baldwin Locomotive Co.** has received an order for one locomotive from a Brazilian railroad.

**Birmingham Southern** has ordered five diesel-electric locomotives from American Locomotive Co.

**Cincinnati, New Orleans & Texas Pacific** is inquiring for 10 steel side dump cars, drop door type, air operated.

**Reading Road** will build 200 gondola cars and 200 automobile cars.

**American Car & Foundry Motors Co.** has received orders for 82 motor coaches, 55 from Eastern Massachusetts Street Railway, Boston, and 27 from Transit Co. of Harrisburg, Harrisburg, Pa.

**Chicago & Eastern Illinois** is inquiring for 500 cars.

#### RAILS AND TRACK SUPPLIES

**Missouri Pacific** has been authorized to purchase 2000 tons of 112-lb. rails and necessary fastenings and accessories at a cost of $186,000.

## Milcor Plans Large Milwaukee Expansion

MILCOR Steel Co., Milwaukee, recently acquired by Inland Steel Co., Chicago, plans an investment of approximately $250,000 at its main works in Milwaukee and branch plant at Canton, Ohio, to facilitate the handling of new sheet steel products and increased production of present lines. In addition, plans are under consideration for reequipping the Milwaukee sheet mill of the Inland company, which has been idle for seven years, as an operating unit supplying the Milcor works and the Ryerson warehouse in Milwaukee. Louis Kuehn is president of the Milcor firm.

## Steel Furniture Business Gains

WASHINGTON, Sept. 29.—Orders for steel furniture in August were valued at $1,517,200 compared with $1,510,517 in July, according to the Bureau of the Census. In the first eight months of the current year orders aggregated $12,401,885 against $9,765,-062 in the corresponding period of last year.

## . . . . NEW YORK. . . .

***. . . September steel business gains over August.***

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***. . . Delivery situation is driving in business.***

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***. . . Export demand improving and prices increasing.***

NEW YORK, Sept. 29.—September business with most of the steel companies represented here, has been heavier than that of August, in some instances by 25 per cent or more. There have been heavy bookings of hot-rolled bars and sheets during the past week. Deliveries on many grades of sheets are further lengthened, present shipping promises extending into late November and even into December.

In addition to the strong domestic demand, there has been a sharp increase in export orders, brought about mainly by the long deliveries quoted by British and German mills. THE IRON AGE cable from London, published in this issue, refers to the fact that three months' deliveries by British mills are not uncommon. On seamless pipe, German mills are quoting six months or longer. American mills are making more frequent shipment to European countries; examples are hot-rolled strip to a French automobile company and tin plate to Turkey. American export prices have risen in line with higher European export prices. In some foreign markets our domestic prices are taking business in galvanized sheets. Plates, shapes and bars have been advanced to 1.775c. per lb. f. a. s. Atlantic port, which is $4 a ton over the price that ruled early in the year.

In domestic trade, the delivery situation is a very important factor in the building up of backlogs, particularly in sheets. Some buyers have been slow to realize the sold-up condition of the mills, but are now showing a more lively appreciation of the fact that they must get reservations on mill books to be sure of the tonnage they will require for fourth quarter use. A further evidence of the strength of the present situation is that certain large buyers who usually expect concessions in any kind of a market are paying full prices now. While steel mills are discouraging any talk of possible labor troubles in the near future, some steel users have become concerned over recent threats from the Steel Workers' Organizing Committee that seem to indicate a possible effort soon to force the hands of the steel companies on the wage question. This may have the effect of causing buyers to build up inventories as a protection.

A further sharp increase in freight car loadings has quickened the efforts of railroads to repair bad order cars, resulting in additional steel orders.

### *Pig Iron*

In view of the large tonnage already placed for fourth quarter delivery, inquiry for this position is reported to be waning. The strong trend in shipments, however, indicates that numerous customers may have to repeat their purchases before the year is over. Most foundries are busily engaged, and the district's melt probably will continue to expand from week to week. Jobbing establishments are now asking higher prices for castings, and, while in some cases initiators of this movement are still running up against low-priced competition, in general a better marketing policy prevails. Room for further improvement exists. Faced with the high cost of iron scrap, one large foundry in this section has drastically reduced the proportion of scrap to pig iron used in the melt. This tendency may gain headway provided the current small spread between scrap and pig quotations continues. Indicative also of the strong undertone in pig iron is the action of some steel producers in allocating a greater proportion of their blast furnace output to their own needs. In another direction, a better feeling prevails among domestic producers with respect to imported irons. Not only have two of these brands recently gone up in price, but good reason exists for believing that supplies for sale in this country of at least one of these brands have been greatly reduced. Moreover, the active consumption abroad, combined with growing difficulties of an international character, make it appear plausible that tonnage for future importation to this country may be restricted. Devaluation of certain foreign currencies now being undertaken may prove to have an effect upon the price of imported iron, but interests here feel that adjustments would be made to overcome any change which might automatically result.

### *Reinforcing Steel*

No awards of over 100 tons were reported this week, although smaller tonnages were booked in good volume. Price cutting is still in evidence, and both buyers and sellers are becoming apprehensive over possible effects of the Robinson-Patman bill. Bids are being taken today on 359 tons of bars for the New York procurement division of the Treasury Department. Bethlehem Steel Co. received 340 tons for a section of Sixth Avenue subway work.

## . . . CINCINNATI. . .

***. . . Sheet bookings heavy, deliveries extended.***

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***. . . Pig iron orders show upward trend.***

CINCINNATI, Sept. 29.—Sheet steel ordering in this area continues to be very active, bookings the past week, for the second consecutive time, exceeding mill capacity. In fact, the leading interest of this district reports that the largest bookings in the history of the company were placed during the past fortnight. Books are closed on third quarter business, but the current rate of ordering indicates that fourth quarter capacities will be booked in a very short time. Schedules are being set at full capacity for three weeks in advance. On cold-rolled sheets, delivery dates have been advanced to six weeks, with the possibility that in these units capacity re-

quirements for the quarter will be **filed within a short time.**

The immediate cause for sudden rise in sheet steel bookings is the increased activity in automotive demand, although miscellaneous requirements are also expanding under the stimulus of generally improved business conditions. Prices on all items are firm and consumers have become more interested in prompt deliveries than in prices.

Ingot production is at the peak for the year as reports indicate a rate of about 92 per cent; 31 out of 34 open hearths are now in operation with three plants running furnaces at 100 per cent.

First hints of foundrymen's desire to anticipate needs were seen the past week, when fourth quarter pig iron ordering turned upward and exceeded the early third quarter demand. Large tonnages, however, are not yet in evidence. The only factor that may induce heavy anticipatory buying is the current belief that furnace capacity will be taxed should the weekly demand continue its steady uptrend. Bookings the past week totaled about 1800 tons, a decided increase over the preceding period. Factory operations tend upward as automobile and stove plants swing into more normal operation. The melt is estimated at about 70 per cent of capacity.

Movement of foundry coke is moderately heavier as district foundries increase operations. Oven interests refrain from announcing October prices, and it appears that these may not become available until almost the last minute.

Steel jobbers report that September demand indicates only a small increase over August as building demand lessens. The bulk of current demand continues to come from industrial sources.

## ....BUFFALO....

***... Viaduct calls for 3800 tons of steel.***

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***... Steel ingot output is unchanged.***

BUFFALO, Sept. 29.—John W. Cowper, Inc., of Buffalo is low general bidder on the Tifft Street viaduct, the largest prospective construction job in this territory. This contract will require 1300 tons of reinforcing bars and 2500 tons of structural steel. The successful steel bidders will be announced some time this week.

The successful bidder on the Best Street stadium job, which is expected to be a billet reinforcing job, will be announced some time this week.

The steel mill rate is about the same as last week, with Bethlehem's Lackawanna plant operating 23 open hearths; Republic Steel, 6, and Wickwire-Spencer, 2. The Seneca sheet division of Bethlehem continues to operate at a high gait, despite the activities of the new strip mill.

Pig iron production remains at 11 furnaces, though Wickwire-Spencer is expected to place a long idle stack in blast this week. Pig iron sales continue in satisfactory volume.

Warehouse prices will be advanced in line with recent increases by mills on some products.

## ...BOSTON...

***... Pig iron buying at steady rate.***

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***... Shortage of molders affects foundries.***

BOSTON, Sept. 29.—Pig iron buying is now very largely in 50 to 100 ton lots, but is continuous, and the weekly aggregate is satisfactory to furnace representatives. At their current rate of operations, large consumers are covered for fourth quarter in most instances. The foundry melt is still handicapped by a lack of molders, yet by-product foundry coke shipments by New England makers are around 25 per cent larger than a year ago.

New England general industrial activity is holding up well. Westinghouse Electric & Mfg. Co.'s East Springfield, Mass., refrigeration and air conditioning units are again in full operation after interruption due to installation of equipment to increase production. Gilbert & Barket Mfg. Co., gasoline pumps, is employing 1338 men, the most in five years. The Eastern Massachusetts Street Railway has just bought 55 more motor coaches, making a total of 240 on this operation, which is one reason why sales of rails to New England railroads are steadily decreasing.

# . . PHILADELPHIA . .

***. . . Consumers show little inclination to anticipate price advances.***

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***. . . Wire products are advanced $2 a ton, nails $3 a ton.***

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***. . . Shortage of semi-finished material is becoming serious.***

PHILADELPHIA, Sept. 29.—Although only two days of this quarter remain, and prices on certain items will rise Thursday, customers are buying very little in anticipation of the increase. Day-to-day orders from consumers are in good volume, but specifications are mostly for immediate use, and even jobbers are not taking the fullest advantage of the opportunity to build up their stocks at the old prices. Deliveries from most mills, on those products which have been increased in price, obtain present prices when specified either at mills' convenience or before Oct. 15, while orders asking for delivery after that date go at the new prices. One large producer is not opening fourth quarter books until Oct. 1.

The situation in semi-finished steel is becoming more acute daily. At least two large sellers have turned down sizable orders for rerolling and forging billets and all mills but one report that capacity is being strained to the utmost to accommodate the demands from their own finishing mills. It has been reported that already one large rerolling mill is so hard-pressed for semi-finished material that it will buy from anyone who will sell. But it is still unable to satisfy its needs.

In spite of the fact that one furnace was taken from production both at Pencoyd and Alan Wood, forcing the district operating rate down one point to 55 per cent of capacity, mill backlogs remain in about the same position as last week. All producers still believe that production will be sustained at a high level over the remainder of the year.

### *Pig Iron*

Foundries continue to operate at a high rate, and demands for iron are frequent and in good volume. A direct increase in pig iron purchases as a result of high scrap prices has been noticed by sellers here. Former carload lots have lately tended to become orders of 200 to 300 tons. Some of this increase is doubtless due to anticipation of a possible fourth quarter price increase, inasmuch as a rise in domestic prices will be more easily sustained now that Russian and Dutch irons have been advanced. Sellers of Dutch iron, however, are seeing that buyers here have every opportunity to cover as far ahead as second quarter, 1937, at present price levels.

### *Shapes and Bars*

A fair amount of activity is in evidence although actual tonnage involved is light. Bethlehem Fabricators, Inc., received 400 tons of shapes for a colliery at Shamokin, Pa., Bethlehem Contracting Co., was awarded 100 tons for conveyor supports at Tamaqua, Pa., 120 tons of shapes for a H. F. Morris Co. warehouse in Philadelphia went to Morris-Wheeler Co., and 450 tons for a boiler house at the Maxwell Colliery, Ashley, Pa., went to the Reading Metal Craft Co. About 1000 tons of shapes are pending in Pennsylvania highway department jobs. Reinforcing steel remains inactive, although 700 tons of bars for a warehouse in Philadelphia is coming up for bids, Oct. 1.

### *Sheets and Plates*

Mill backlogs for sheets extend from three to five weeks, and current demand shows no sign of declining. Although hot-rolled annealed sheets are up $2 a ton for fourth quarter delivery, little anticipatory buying has been reported. Fabricators of sheets for underground storage tanks have been particularly active lately. Plate business has fallen off even


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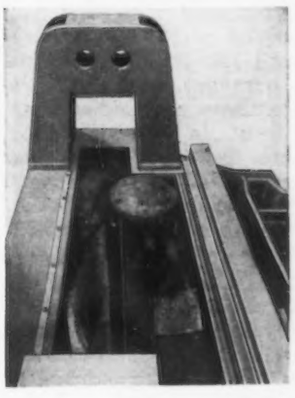
**SCRAP BALERS**



STYLE

**100 TC**

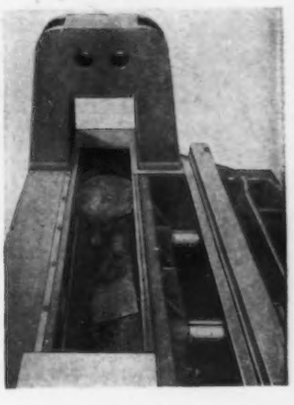
(100 x 51 x 36)

*and other sizes*

*Also Regular*

**Double Ram Presses**

*in all sizes*



**GALLAND-HENNING MANUFACTURING COMPANY**

2724 S. 31st Street , Milwaukee, Wisconsin

COMPLETE LINE OF BALERS: Electric and Hydraulic, also HYDRAULIC PRESSES AND PUMPS

more this week, and one mill can now ship in seven days although most of the other rollers require ten days to two weeks. One leading producer, however, turned down a large tonnage of plates a few weeks ago because delivery requirements could not be met, and has about three months work booked in its plate mill. Baldwin Locomotive Co. has received an order for a locomotive from a Brazilian Railway, new railroad car buying is expected soon, and all district ship yards are operating near capacity.

### *Wire Nails and Wire Products*

Announcements released Monday confirmed earlier forecasts of a price advance on wire rods, manufacturing wire and wire nails. The former two advanced $2 a ton, and the latter went up $3. So far, few buyers have been ordering in anticipation of the increase, although demand for immediate consumption has been good. Heavier specifications, however, are expected the remaining two days of the quarter especially in nails. In view of the recent lowering of nails to a 1.90c. base in response to weaknesses in the price structure, the newly established 2.05c. base may be put to severe tests over the next three months.

### *Imports*

The following iron and steel imports were received here last week: 5252 tons of chrome ore from Cuba; 1648 tons of pig iron from British India; 2969 tons of pig iron from Soviet Russia; 1 ton of manganese ore from Germany; 10 tons of steel tubes, 8 tons of steel forgings, 129 tons of steel bands, 4 tons of diamond plates, 319 tons of steel bars from Sweden, and 15 tons of structural shapes and 388 tons of steel bars from France.

### . . . *Canadian National to build new line.*

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### . . . *Steel Co. of Canada to expand facilities.*

TORONTO, Sept. 29.—Indications of new business from the railroads came with the announcement that the Canadian National Railways will build a new line through northwestern Quebec, slightly more than 100 miles long. It is expected a rail contract for the new line will be awarded at an early date.

Announcement from Hamilton, Ont., is that directors of the Steel Co. of Canada, Ltd., have decided to construct a new 150-ton open hearth furnace, and also are considering further plant additions. The proposed additions are to replace obsolete equipment.

Demand for foundry and malleable pig iron is holding steady. Sales for the past week approximated 800 tons, made up of lots ranging from 50 to 200 tons. Business for the week largely was for spot delivery, but it is stated that a couple of melters have covered for last quarter needs. Others may follow in view of prospective higher prices for iron. Four furnaces now are blowing in Canada, with production 36 per cent of all blast furnace capacity.

### . . . *Pig iron buying takes a spurt.*

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### . . . *Steel buying also at brisk pace.*

BIRMINGHAM, Sept. 29.—With the closing of the third quarter, there was a marked increase in pig iron shipments. The September movement ranks as one of the three best of the year, and a large tonnage went to the foundries. Pig iron buying, which lagged behind steel for many months, is now much better. Foundries are now booking freely for the last quarter, with the result that the furnaces will start out heavily loaded with forward business. Small foundries, as well as the large ones, are participating in the buying movement now in progress. Talk of an advance in pig iron prices has been heard, but local furnace officials say that nothing will be done at this time. The base price remains at $15.88.

Despite all of the buying activity of the past several months, the steel market continues to produce a steady volume of new tonnage. Bookings in all general lines are strong and indications point to satisfactory conditions all through the last quarter.

Production of iron and steel is maintaining a steady rate, with 14 open hearths and 10 blast furnaces operating. There has been no recent change.

### . . . *Iron and steel markets continue strong.*

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### . . . *Delivery delays cause loss of export orders.*

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### . . . *Prices advance for some foreign countries.*

LONDON, ENGLAND, Sept. 28 (By Cable).—All departments of the British iron and steel industry are strong, despite the remarkable expansion in output. Stringency has again developed in several lines, notably foundry iron, and makers are rationing supplies to customers.

All British supplies of semi-finished steel are fully booked for several month ahead, but large supplementary imports are necessary to take care of the home requirements. The British Iron and Steel Federation is reported to be negotiating for 50,000 to 70,000 tons of Continental semi-finished steel in addition to the quota during the past quarter, and is seeking an option on a similar quantity for the first quarter of 1937.

Overseas business in finished steel is slower, due, no doubt, to long deliveries quoted, but home orders for construction and shipyard material continue to increase and delivery delays are causing inconvenience to users. Rail mills are busy, and the period is approaching when large contracts are usually placed. There is a steady demand for tin plate both for domestic and export shipment.

Continental iron and steel markets are still quiet, but the lull is welcomed, as makers are booked so heavily that delivery delays of three months are not uncommon. The International Steel Cartel has raised prices for certain products for shipment to South America, Sweden, Spanish isles and the colonies of North Africa. The International Wire Rod Cartel is maintaining production for the fourth quarter at 350,000 tons, and has raised prices for several foreign markets.

The Belgian Ougree Marihaye concern plans to reopen its idle Monceau works.

British prices are unchanged. So also are Continental gold prices.

# . . . NON-FERROUS . . .

## . . . *September copper sales total 38,521 tons.*

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## . . . *Lead in strong demand; zinc quiet.*

NEW YORK, Sept. 29.—Domestic copper continued quotable last week at 9.75c. a lb., Connecticut Valley. Demand was moderate, sales from day to day averaging about 1800 tons. There was no further talk of a higher market, and currently it does not look as if 10c. copper will put in an appearance any time soon. Selling interests, however, are satisfied with the steady undertone, and consider the 38,521 tons sold so far this month a fair volume of business. Export copper declined in price as a result of the international currency situation, and at the moment is selling for about 9.80c. a lb., or 10 points under its top level last week.

### *Lead*

Sales of lead last week continued in above normal volume, with all sellers doing a very satisfactory business. In at least one direction the demand felt was excellent. The same producer has had no difficulty in disposing of each day's intake usually during the morning hours, and has had to compile waiting lists of needy customers. That tonnages are moving into consumption at a lively rate is indicated by current shipments. This aspect of the situation is particularly wholesome, and, as a result, the trade looks forward to another large reduction in stocks when September statistics are published. The price for lead holds firmly to the basis of 4.45c. a lb., St. Louis. Although for the past three months demand has been exceptional, producers have maintained quotations because reserve stocks are still a cumbersome factor. To raise the price would be to invite increased production, something the trade is not quite ready for yet. The current week has opened in good fashion, with consumers rushing to cover November needs. The inquiry is reported as being well diversified. October requirements are probably about 90 per cent covered by now. As reported last week, refined stocks declined 12,848 tons during August. Shipments were 46,388 tons, and production 33,542 tons.

### *Tin*

The slightly higher tin quotation of 45.40c. a lb. in effect today as opposed to the price a week ago is reported drawing little or no business, the market being in a position of marking time until international currency problems are clarified. Demand during the past week was spasmodic, and a feature was the appreciable volume of business on Saturday when the break in sterling forced tin quotations temporarily lower. The spot price on that day ranged from 44.37½c. to 45.00c. a lb., the latter level taking effect toward closing time. No decision on restriction renewal was reached at the international committee's recent meeting, but production quotas were left unchanged. The committee will meet again in about a month. Meanwhile negotiations with Siam are reported making progress.

### *Zinc*

The undertone in this market remains firm. While sales are quiet, movement into consumption continues to be encouraging. The price has suffered no change, and is holding with ease to the 4.85c. East St. Louis basis. Orders for prime Western grade last week aggregated 1644 tons, shipments came to 4033 tons and undelivered tonnage accordingly declined 2389 tons. The unfilled orders on the books of principal producers and sellers now amount to 52,595 tons.

### The Week's Prices. Cents Per Pound for Early Delivery

| | Sept. 23 | Sept. 24 | Sept. 25 | Sept. 26 | Sept. 28 | Sept. 29 |
|---|---|---|---|---|---|---|
| Electrolytic copper, Conn.* | 9.75 | 9.75 | 9.75 | 9.75 | 9.75 | 9.75 |
| Lake copper, N. Y. | 9.87½ | 9.87½ | 9.87½ | 9.87½ | 9.87½ | 9.87½ |
| Straits tin, Spot, New York | 44.90 | 45.12½ | 45.20 | .... | 45.25 | 45.40 |
| Zinc, East St. Louis | 4.85 | 4.85 | 4.85 | 4.85 | 4.85 | 4.85 |
| Zinc, New York† | 5.22½ | 5.22½ | 5.22½ | 5.22½ | 5.22½ | 5.22½ |
| Lead, St. Louis | 4.45 | 4.45 | 4.45 | 4.45 | 4.45 | 4.45 |
| Lead, New York | 4.60 | 4.60 | 4.60 | 4.60 | 4.60 | 4.60 |

* Delivered Connecticut Valley; price ¼c. lower delivered in New York.
† Includes emergency freight charge.

Aluminum, virgin 99 per cent plus 19.00c.-21.00c. a lb. delivered.
Aluminum, No. 12 remelt No. 2 standard, in carloads, 16.50c. a lb. delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 12.50c. a lb., New York.
Quicksilver, $89.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 9.50c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

#### From New York Warehouse

*Delivered Prices, Base per Lb.*

| | |
|---|---|
| Tin, Straits pig | 46.50c. to 47.50c. |
| Tin, bar | 48.50c. to 49.50c. |
| Copper, Lake | 10.75c. to 11.75c. |
| Copper, electrolytic | 10.75c. to 11.75c. |
| Copper, castings | 10.50c. to 11.50c. |
| *Copper sheets, hot-rolled | 17.50c. |
| *High brass sheets | 15.62½c |
| *Seamless brass tubes | 17.87½c. |
| *Seamless copper tubes | 18.00c. |
| *Brass rods | 13.62½c. |
| Zinc, slabs | 5.75c. to 6.75c. |
| Zinc, sheets (No. 9), casks, 1200 lb. and over | 10.25c. |
| Lead, American pig | 5.10c. to 6.10c. |
| Lead, bar | 6.10c. to 7.10c. |
| Lead, Sheets, cut | 8.25c. |
| Antimony, Asiatic | 13.00c. to 14.00c. |
| Alum., virgin, 99 per cent plus | 23.30c. |
| Alum., No. 1 for remelting, 98 to 99 per cent | 18.50c. to 20.00c. |
| Solder, ½ and ½ | 28.50c. to 29.50c. |
| Babbitt metal, commercial grades | 25.00c. to 60.00c. |

* These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 33⅓ per cent allowed off for extras, except copper tubes and brass rods, on which allowance is 40 per cent.

#### From Cleveland Warehouse

*Delivered Prices Per Lb.*

| | |
|---|---|
| Tin, Straits pig | 49.25c. |
| Tin, bar | 51.25c. |
| Copper, Lake | 10.75c. to 11.00c. |
| Copper, electrolytic | 10.75c. to 11.00c. |
| Copper, castings | 10.50c. to 10.75c. |
| Zinc, slabs | 6.50c. to 6.75c. |
| Lead, American pig | 5.20c. to 6.50c. |
| Lead, bar | 8.50c. |
| Antimony, Asiatic | 15.50c. |
| Babbitt metal, medium grade | 19.00c. |
| Babbitt metal, high grade | 52.25c. |
| Solder, ½ and ½ | 26.50c. |

#### Old Metals, Per Lb., New York

*Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)*

| | Dealers' Buying Prices | Dealers' Selling Prices |
|---|---|---|
| Copper, hvy. crucible | 7.50c. | 8.25c. |
| Copper, hvy. and wire | 7.37½c. | 7.87½c. |
| Copper, light and bottoms | 6.37½c. | 6.87½c. |
| Brass, heavy | 4.25c. | 4.87½c. |
| Brass, light | 3.50c. | 4.25c. |
| Hvy. machine composition | 6.25c. | 6.75c. |
| No. 1 yel. brass turnings | 5.25c. | 5.75c. |
| No. 1 red brass or compos. turnings | 5.87½c. | 6.37½c. |
| Lead, heavy | 3.62½c. | 4.00c. |
| Sheet aluminum | 13.25c. | 14.75c. |
| Zinc | 2.50c. | 2.87½c. |
| Cast aluminum | 12.12½c. | 13.25c. |

# IRON AND STEEL SCRAP

***. . . Composite price unchanged at $16.75 a gross ton.***

o o o

***. . . Market declines at Cleveland, and softness develops at other points.***

SINCE early July, the scrap market has steadily advanced from $13.08 to a composite price of $16.75, which was established last week. Developments during the past seven days, however, indicate that sentiment has shifted sharply in the country's buying centers. Material is coming out more freely, in some cases sellers are definitely trying to liquidate accumulations, and in certain sections, such as eastern Pennsylvania, Buffalo and in New England, consumers are dropping out of the market for the time being.

However, neither buyer nor consumer looks for any serious weakness in scrap over the remainder of the year. The outlook for sustained steel production is encouraging. Furthermore, delay in shipments due to winter weather will within several months be a pertinent factor in preventing drastic price weakness.

## *Pittsburgh*

For the time being at least, the forward movement in scrap prices has ended. Heavy tonnages of No. 2 have been moving in from the West, and, when limitations were placed on deliveries at Youngstown, some of this material moved into the Pittsburgh district. Consequently No. 2 has weakened and is now quotable at $16.25 to $16.75. Another factor making for a slightly easier tone is the withdrawing from the market of large consumers who purchased heavily during the last few weeks.

## *Chicago*

Heavy melting steel is moving freely to mills at $16.50 a gross ton. Several days ago brokers were trading in this grade at $17 but recently they have been inclined to peg the price at $16.75. Scrap continues to move in fast, but mills accept cars as they appear on their tracks, and it is doubtful if more than meager tonnages are being piled by consumers. The practice of welding is making punchings a scarce article, and plate scrap, 12 in. and under, is difficult to find.

## *Cleveland*

After a rather steady advance over the past three months, during which steel-making scrap was marked up $3 a ton, the market has suffered a 50c. set-back on these grades in the Cleveland and Valley districts. The last advance brought out quite a liberal supply of scrap and there was no consumer purchase of steel-making scrap during the week to help sustain prices at the recent peak. The only consumer activity was the purchase of a small tonnage of blast furnace scrap at $11.50 by a Cleveland mill. Quotations on blast furnace grades are unchanged. Michigan automobile plants have issued their October lists, which are considerably larger than their September offerings.

## *Philadelphia*

The market leveled off this week with the cessation of quantity buying by district mills. The leading broker, however, continues to offer $15.50 for No. 1 steel, and $14 for No. 2 for delivery to all Eastern consuming points, thus maintaining the strength of the past week and justifying quotable levels on steel-making grades. Budd Mfg. Co.'s October list of 3000 tons of compressed bundles went to the Coatesville consumer at about $16 f.o.b. About 500 tons of miscellaneous scrap on the same list was bid in by a local broker.

## *Buffalo*

The Republic Steel Corp. has followed the lead of the Bethlehem Steel Corp. in retiring from the scrap market. Consequently the market is inactive though still strong. American Radiator Corp. is likewise out of the market. Dealers see evidence of a desire on the part of consumers to prevent a runaway market which was likely to ensue with the present high degree of open-hearth operation. Scrap is coming out more freely in the past week or so.

## *New York*

While prices are unchanged from a week ago, the market here has lost buoyancy and has a much softer tone. Some mills which draw upon this area for supplies have even begun to hold up shipments, a development in marked contrast to conditions prior to last week. Outcoming supplies involve 2000 tons of rails scrapped from the Broadway surface lines and sold to M. Samuel & Son, Brooklyn, for $13.17 a ton, on the ground. A large steel producer is reported to have submitted a bid of $13 for these rails. The nine Government vessels recently placed on the market have not yet been awarded, but Schiavone-Bonomo Corp. was low bidder. Approximately 10,000 tons of recoverable scrap is involved.

## *Detroit*

Scrap prices are unchanged for the second consecutive week, but the market continues strong. Bids on a sizable list involving all types of material issued by a prominent auto plant are well in line with present quoted prices. Mills seem to be adopting a waiting policy and local dock inventories are high at the present time. Local plants seem to be willing to unload scrap where a few weeks ago they were holding back in the hope of better prices.

## *St. Louis*

The steady advance in prices of scrap iron has been checked. While quotations are unchanged from the preceding week, the market is said to be a bit easier as a result of an improved flow of scrap from the country. An East Side melter has bought 5000 tons of heavy melting steel from three dealers.

## *Cincinnati*

A reported decline in mill buying in other districts has checked the enthusiasm of district scrap dealers who are tending to withdraw their support from the strong market of the preceding three weeks. This technical softness, however, does not definitely reflect actual conditions in the district market, because mill ordering has not yet reached beyond the coverage current needs. Local mills have steadily exercised pressure on quotations, but dealers have refused concessions and have shipped material into other areas where more attractive prices made profitable transactions possible.

## *Boston*

Worcester dealers, after advancing prices on heavy melting steel 15c. to stimulate offerings for American Steel & Wire Co. consumption, obtained so much material that the advance has been withdrawn. The current tendency among holders of all sorts of scrap seems to be to liquidate their holdings. Pennsylvania buyers of stove plate and breakable cast have dropped offers 25c. a ton. Exporters apparently have covered immediate requirements for they are buying little material today. A boat is due here this week to load 3100 tons of scrap for England, and she will be scrapped abroad after unloading. Another boat is scheduled to arrive soon to load 8000 tons for a European port, presumably England.

# Iron and Steel Scrap Prices

## PITTSBURGH

**Per gross ton delivered to consumer:**

| | |
|---|---|
| No. 1 hvy. mltng. steel. | $18.00 to $18.50 |
| No. 2 hvy. mltng. steel. | 16.25 to 16.75 |
| No. 2 RR. wrought .... | 18.00 to 18.50 |
| Scrap rails ..... | 18.25 to 18.75 |
| Rails, 3 ft. and under.. | 19.50 to 20.00 |
| Comp. sheet steel .... | 18.00 to 18.50 |
| Hand bundled sheets.. | 17.00 to 17.50 |
| Hvy. steel axle turn... | 16.50 to 17.00 |
| Machine shop turn.... | 12.50 to 13.00 |
| Short shov. turn..... | 12.50 to 13.00 |
| Mixed bor. & turn..... | 11.50 to 12.00 |
| Cast iron borings ..... | 12.50 to 13.00 |
| Cast iron carwheels... | 17.00 to 17.50 |
| Hvy. breakable cast... | 14.50 to 15.00 |
| No. 1 cast ..... | 16.00 to 16.50 |
| RR. knuckles & cplrs.. | 20.50 to 21.00 |
| Rail coil & leaf springs | 20.50 to 21.00 |
| Rolled steel wheels.... | 20.50 to 21.00 |
| Low phos. billet crops. | 21.00 to 21.50 |
| Low phos. sh. bar.... | 20.50 to 21.00 |
| Low phos. punchings.. | 20.00 to 20.50 |
| Low phos. plate scrap. | 20.00 to 20.50 |
| Steel car axles ..... | 19.50 to 20.00 |

## CLEVELAND

**Per gross ton delivered to consumer:**

| | |
|---|---|
| No. 1 hvy. mltng. steel. | $15.00 to $15.50 |
| No. 2 hvy. mltng. steel. | 14.00 to 14.50 |
| Comp. sheet steel .... | 14.50 to 15.00 |
| Light bund. stampings | 11.00 to 11.50 |
| Drop forge flashings.. | 14.00 to 14.50 |
| Machine shop turn.... | 10.00 to 10.50 |
| Short shov. turn..... | 10.50 to 11.00 |
| No. 1 busheling ..... | 14.00 to 14.50 |
| Steel axle turnings.... | 11.00 to 11.50 |
| Low phos. billet crops | 19.00 to 19.50 |
| Cast iron borings ..... | 10.50 to 11.00 |
| Mixed bor. & turn..... | 10.50 to 11.00 |
| No. 2 busheling ..... | 10.50 to 11.00 |
| No. 1 cast ..... | 16.75 to 17.25 |
| Railroad grate bars... | 9.00 to 9.50 |
| Stove plate ..... | 9.00 to 9.50 |
| Rails under 3 ft. ..... | 19.00 to 19.50 |
| Rails for rolling ..... | 16.50 to 17.00 |
| Railroad malleable ... | 17.75 to 18.00 |
| Cast iron carwheels... | .... 15.50 |

## PHILADELPHIA

**Per gross ton delivered to consumer:**

| | |
|---|---|
| No. 1 hvy. mltng. steel. | $15.50 to $16.00 |
| No. 2 hvy. mltng. steel. | 14.00 to 14.50 |
| Hydraulic bund., new.. | 15.00 to 15.50 |
| Hydraulic bund., old.. | 12.50 to 13.00 |
| Steel rails for rolling.. | 17.00 to 17.50 |
| Cast iron carwheels.. | 16.50 to 17.00 |
| Hvy. breakable cast... | 15.50 to 16.00 |
| No. 1 cast ..... | 16.50 to 17.00 |
| Stove plate (steel wks.) | 12.50 to 13.00 |
| Railroad malleable ... | .... 16.50 |
| Machine shop turn.... | 9.50 to 10.00 |
| No. 1 blast furnace.... | 8.00 to 8.50 |
| Cast borings ..... | 8.00 to 8.50 |
| Heavy axle turnings.. | 12.50 to 13.00 |
| No. 1 low phos. hvy.... | 18.50 to 19.00 |
| Couplers & knuckles... | 19.00 to 19.50 |
| Rolled steel wheels.... | 19.00 to 19.50 |
| Steel axles ..... | 20.50 to 21.00 |
| Shafting ..... | 20.50 to 21.00 |
| No. 1 RR. wrought... | 15.50 to 16.00 |
| Spec. iron & steel pipe. | 12.50 to 13.00 |
| Bundled sheets ..... | 14.00 to 14.50 |
| No. 1 forge fire ..... | 14.50 to 15.00 |
| Cast borings (chem.).. | 10.50 to 13.00 |

## CHICAGO

**Delivered to Chicago district consumers:**

| | *Per Gross Ton* |
|---|---|
| Hvy. mltng. steel..... | $16.00 to $16.50 |
| Auto. hvy. mltng. steel. | 14.00 to 14.50 |
| Shoveling steel ..... | 16.00 to 16.50 |
| Hydraul. comp. sheets. | 15.00 to 15.50 |
| Drop forge flashings.. | 13.50 to 14.00 |
| No. 1 busheling ..... | 14.75 to 15.25 |
| Rolled carwheels ..... | 18.00 to 18.50 |
| Railroad tires, cut .... | 18.00 to 18.50 |
| Railroad leaf springs.. | 17.50 to 18.00 |
| Axle turnings ..... | 15.00 to 15.50 |
| Steel coup. & knuckles | 18.00 to 18.50 |
| Coil springs ..... | 18.50 to 19.00 |
| Axle turn. (elec.) ..... | 16.00 to 16.50 |
| Low phos. punchings.. | 18.75 to 19.25 |
| Low phos. plates, 12 in. and under ..... | 18.75 to 19.25 |
| Cast iron borings .... | 9.00 to 9.50 |
| Short shov. turnings.. | 10.00 to 10.50 |
| Machine shop turn.... | 8.50 to 9.00 |
| Rerolling rails ..... | 17.00 to 17.50 |
| Steel rails under 3 ft... | 17.00 to 17.50 |
| Steel rails under 2 ft... | 18.50 to 19.00 |
| Angle bars, steel ..... | 18.00 to 18.50 |
| Cast iron carwheels... | 16.50 to 17.00 |
| Railroad malleable .... | 18.50 to 19.00 |
| Agric. malleable ..... | .... 15.00 |
| | *Per Net Ton* |
| Iron car axles ..... | $18.50 to $19.00 |
| Steel car axles ..... | 17.75 to 18.25 |
| No. 1 RR. wrought..... | 14.25 to 14.75 |
| No. 2 RR. wrought.... | $14.25 to $14.75 |
| No. 2 busheling, old... | 6.00 to 6.50 |
| Locomotive tires .... | 13.00 to 13.50 |
| Pipes and flues ..... | 8.50 to 9.00 |
| No. 1 machinery cast.. | 14.00 to 14.50 |
| Clean auto. cast ..... | 13.00 to 13.50 |
| No. 1 railroad cast.... | 13.50 to 14.00 |
| No. 1 agric. cast..... | 11.00 to 11.50 |
| Stove plate ..... | 8.75 to 9.25 |
| Grate bars ..... | 9.50 to 10.00 |
| Brake shoes ..... | 10.50 to 11.00 |

## BUFFALO

**Per gross ton, f.o.b. consumers' plants:**

| | |
|---|---|
| No. 1 hvy. mltng. steel. | $15.00 to $15.50 |
| No. 2 hvy. mltng. steel. | 13.50 to 14.50 |
| Scrap rails ..... | 14.00 to 14.50 |
| New hy. b'ndled sheets | 13.50 to 14.00 |
| Old hydraul. bundles.. | 12.50 to 13.00 |
| Drop forge flashings.. | 13.50 to 14.00 |
| No. 1 busheling ..... | 13.50 to 14.50 |
| Hvy. axle turnings.... | 10.50 to 11.00 |
| Machine shop turn.... | 7.50 to 8.50 |
| Knuckles & couplers.. | 17.00 to 17.50 |
| Coil & leaf springs.... | 17.00 to 17.50 |
| Rolled steel wheels.... | 17.00 to 17.50 |
| Low phos. billet crops. | 17.50 to 18.00 |
| Short shov. turnings.. | 9.50 to 10.00 |
| Mixed Bor. & turn..... | 9.00 to 9.50 |
| Cast iron borings .... | 9.00 to 9.50 |
| No. 2 busheling ..... | 11.00 to 11.50 |
| Steel car axles ..... | 17.00 to 17.50 |
| Iron axles ..... | 12.00 to 12.50 |
| No. 1 machinery cast.. | 15.00 to 15.50 |
| No. 1 cupola cast .... | 14.50 to 15.00 |
| Stove plate ..... | 12.00 to 12.50 |
| Steel rails under 3 ft.. | 17.00 to 17.50 |
| Cast iron carwheels... | 13.00 to 14.00 |
| Railroad malleable .... | 17.00 to 18.00 |
| Chemical borings ..... | 10.50 to 11.00 |

## BIRMINGHAM

**Per gross ton delivered to consumer:**

| | |
|---|---|
| Hvy. melting steel..... | .... $11.50 |
| Scrap steel rails ..... | $12.00 to 12.50 |
| Short shov. turnings.. | .... 8.00 |
| Stove plate ..... | .... 8.00 |
| Steel axles ..... | 13.50 to 14.00 |
| Iron axles ..... | 13.50 to 14.00 |
| No. 1 RR. wrought.... | 8.50 to 9.00 |
| Rails for rolling ..... | 13.50 to 14.00 |
| No. 1 cast ..... | .... 12.50 |
| Tramcar wheels ..... | .... 12.00 |

## ST. LOUIS

**Dealers' buying prices per gross ton delivered to consumer:**

| | |
|---|---|
| Selected hvy. steel.... | $14.50 to $15.00 |
| No. 1 hvy. melting.... | 14.25 to 14.75 |
| No. 2 hvy. melting.... | 12.50 to 13.00 |
| No. 1 locomotive tires. | 13.50 to 14.00 |
| Misc. stand.-sec. rails.. | 15.00 to 15.50 |
| Railroad springs ..... | 16.00 to 16.50 |
| Bundled sheets ..... | 9.50 to 10.00 |
| No. 2 RR. wrought ... | 14.50 to 15.00 |
| No. 1 busheling ..... | 8.50 to 9.00 |
| Cast bor. & turn..... | 5.50 to 6.00 |
| Rails for rolling ..... | 15.75 to 16.25 |
| Machine shop turn.... | 4.00 to 4.50 |
| Heavy turnings ..... | 10.50 to 11.00 |
| Steel car axles ..... | 16.00 to 16.50 |
| Iron car axles ..... | 17.00 to 17.50 |
| No. 1 RR. wrought.... | 12.50 to 13.00 |
| Steel rails under 3 ft.... | 16.00 to 16.50 |
| Steel angle bars ..... | 15.50 to 16.00 |
| Cast iron carwheels... | 12.75 to 13.25 |
| No. 1 machinery cast. | 12.50 to 13.00 |
| Railroad malleable .... | 15.00 to 15.50 |
| No. 1 railroad cast.... | 12.50 to 13.00 |
| Stove plate ..... | 7.50 to 8.00 |
| Agricul. malleable .... | 12.50 to 13.00 |
| Grate bars ..... | 9.00 to 9.50 |
| Brake shoes ..... | 11.25 to 11.75 |

## CINCINNATI

**Dealers' buying prices per gross ton:**

| | |
|---|---|
| No. 1 hvy. mltng. steel. | $13.50 to $14.00 |
| No. 2 hvy. mltng. steel. | 11.00 to 11.50 |
| Scrap rails for mltng.. | 14.00 to 14.50 |
| Loose sheet clippings.. | 8.50 to 9.00 |
| Bundled sheets ..... | 10.50 to 11.00 |
| Cast iron borings ..... | 6.50 to 7.00 |
| Machine shop turn..... | 7.50 to 8.00 |
| No. 1 busheling ..... | 11.00 to 11.50 |
| No. 2 busheling ..... | 6.75 to 7.25 |
| Rails for rolling ..... | 14.50 to 15.00 |
| No. 1 locomotive tires.. | 12.50 to 13.00 |
| Short rails ..... | 17.00 to 17.50 |
| Cast iron carwheels.... | 13.50 to 14.00 |
| No. 1 machinery cast.. | 14.00 to 14.50 |
| No. 1 railroad cast.... | 13.50 to 14.00 |
| Burnt cast ..... | 10.00 to 10.50 |
| Stove plate ..... | 10.00 to 10.50 |
| Agricult. malleable .... | 12.50 to 13.00 |
| Railroad malleable .... | 15.00 to 15.50 |

## DETROIT

**Dealers' buying prices per gross ton:**

| | |
|---|---|
| No. 1 hvy. mltng. steel. | $14.00 to $14.50 |
| No. 2 hvy. mltng. steel. | 13.00 to 13.50 |
| Borings and turnings.. | 9.00 to 9.50 |
| Long turnings ..... | $9.00 to $9.50 |
| Short shov. turnings.. | 10.50 to 11.00 |
| No. 1 machinery cast.. | 14.50 to 15.00 |
| Automotive cast ..... | 14.50 to 15.00 |
| Hydraul. comp. sheets. | 14.50 to 15.00 |
| Stove plate ..... | 8.50 to 9.00 |
| New factory bushel.... | 13.50 to 14.00 |
| Old No. 2 busheling .. | 8.50 to 9.00 |
| Sheet clippings ..... | 10.50 to 11.00 |
| Flashings ..... | 13.00 to 13.50 |
| Low phos. plate scrap. | 14.25 to 14.75 |

## CANADA

**Dealers' buying prices per gross ton:**

| | Toronto | Montreal |
|---|---|---|
| Hvy. melting steel..... | $7.50 | $7.00 |
| Rails, scrap ..... | 8.50 | 8.00 |
| Machine shop turn..... | 4.00 | 4.00 |
| Boiler plate ..... | 7.00 | 6.00 |
| Hvy. axle turnings..... | 4.50 | 4.00 |
| Cast borings ..... | 5.00 | 4.50 |
| Steel borings ..... | 4.00 | 4.00 |
| Wrought pipe ..... | 4.00 | 4.00 |
| Steel axles ..... | 8.50 | 9.00 |
| Axles, wrought iron.... | 9.00 | 9.50 |
| No. 1 machinery cast.. | 11.50 | 11.00 |
| Stove plate ..... | 7.50 | 7.00 |
| Standard carwheels .... | 11.00 | 10.50 |
| Malleable ..... | 7.00 | 7.00 |
| Shoveling steel ..... | 6.50 | 6.00 |
| Bushelings ..... | 6.00 | 5.50 |
| Compressed sheets .... | 6.50 | 6.00 |

## YOUNGSTOWN

**Per gross ton delivered to consumer:**

| | |
|---|---|
| No. 1 hvy. mltng. steel. | $17.00 to $17.50 |
| Hydraulic bundles .... | 16.50 to 17.00 |
| Machine shop turn..... | 12.00 to 12.50 |

## NEW YORK

**Dealers' buying prices per gross ton:**

| | |
|---|---|
| No. 1 hvy. mltng. steel. | $11.75 to $12.25 |
| No. 2 hvy. mltng. steel. | 10.75 to 11.25 |
| Hvy. breakable cast.. | 11.50 to 12.00 |
| No. 1 machinery cast. | 12.00 to 12.50 |
| No 2 cast ..... | 10.25 to 10.75 |
| Stove plate ..... | 9.00 to 9.50 |
| Steel car axles ..... | 16.00 to 17.00 |
| Shafting ..... | 15.00 to 16.00 |
| No. 1 RR. wrought ... | 12.00 to 12.50 |
| No. 1 wrought long.... | 11.00 to 11.50 |
| Spec. iron & steel pipe | 10.50 to 11.00 |
| Forge fire ..... | 8.00 to 8.50 |
| Rails for rolling ..... | 11.00 to 11.50 |
| Short shov. turnings.. | 5.75 to 6.25 |
| Machine shop turn..... | 6.25 to 6.50 |
| Cast borings ..... | 6.25 to 6.50 |
| No. 1 blast furnace.... | 5.00 to 5.50 |
| Cast borings (chem.).. | 10.00 to 11.00 |
| Unprepar. yard scrap. | 6.50 to 7.00 |

**Per gross ton, delivered local foundries:**

| | |
|---|---|
| No. 1 machn. cast..... | $14.00 to $14.50 |
| No. 1 hvy. cast cupola. | 11.50 to 12.00 |
| No. 2 cast ..... | 10.50 to 11.00 |

**Add 25c. to 50c. to above quotations to secure North Jersey prices.**

## BOSTON

**Dealers' buying prices per gross ton:**

| | |
|---|---|
| No. 1 hvy. mltng. steel. | $11.40 to $11.90 |
| Scrap rails ..... | 11.90 to 12.15 |
| No. 2 steel ..... | 10.40 to 10.90 |
| Breakable cast ..... | 10.00 to 10.25 |
| Machine shop turn..... | 6.50 to 6.65 |
| Pund. skeleton long... | 10.25 to 10.50 |
| Shafting ..... | 15.25 to 15.75 |
| Cast bor. chemical..... | 5.00 to 7.00 |

**Per gross ton delivered consumers' yards:**

| | |
|---|---|
| Textile cast ..... | $12.00 to $13.50 |
| No. 1 machine cast .. | 12.00 to 13.50 |
| Stove plate ..... | 9.50 to 10.00 |

## EXPORT

**Brokers' buying prices per gross ton:**

| | |
|---|---|
| *New York, delivered alongside barges* | |
| No. 1 hvy. mltng. steel. | $11.50 to $12.00 |
| No. 2 hvy. mltng. steel. | 10.50 to 11.00 |
| No. 2 cast ..... | .... 10.00 |
| Stove plate ..... | .... 9.25 |
| Rails (scrap) ..... | 11.50 to 12.00 |
| ***Boston, on cars at Army Base or Mystic Wharf*** | |
| No. 1 hvy. mltng. steel. | $12.00 to $12.50 |
| No. 2 hvy. mltng. steel. | 11.00 to 11.50 |
| Rails (scrap) ..... | 12.50 to 12.75 |
| Stove plate ..... | 7.75 to 8.00 |
| Machine shop turn..... | 6.00 to 6.25 |
| ***New Orleans, on cars at Stuyvesant Dock*** | |
| No. 1 hvy. mltng. steel. | $12.60 to $12.75 |
| No. 2 hvy. mltng. steel. | 11.60 to 11.75 |
| ***Los Angeles, on cars or trucks at local piers*** | |
| No. 1 hvy. mltng. steel. | $10.50 to $11.00 |
| Compressed bundles .. | 8.50 to 9.00 |

# PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

## SEMI-FINISHED STEEL

### Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are $2 a ton higher, and delivered Detroit $3 higher.

| | *Per Gross Ton* |
|---|---|
| Rerolling | $32.00 |
| Forging quality | 39.00 |

### Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

| | *Per Gross Ton* |
|---|---|
| Open-hearth or Bessemer | $32.00 |

### Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

| | *Per Lb.* |
|---|---|
| Grooved, universal and sheared | 1.80c. |

### Wire Rods

(No. 5 to 15/32 in.)

| | *Per Gross Ton* |
|---|---|
| F.o.b. Pittsburgh or Cleveland | $40.00 |
| F.o.b. Chicago, Youngstown or Anderson, Ind. | 41.00 |
| F.o.b. Worcester, Mass. | 42.00 |
| F.o.b. Birmingham | 43.00 |
| F.o.b. San Francisco | 49.00 |
| F.o.b. Galveston | 46.00 |

## BARS, PLATES, SHAPES

### Iron and Steel Bars

*Soft Steel*

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 2.05c. |
| F.o.b. Chicago or Gary | 2.10c. |
| F.o.b. Duluth | 2.20c. |
| Del'd Detroit | 2.20c. |
| F.o.b. Cleveland | 2.10c. |
| F.o.b. Buffalo | 2.15c. |
| Del'd Philadelphia | 2.36c. |
| Del'd New York | 2.40c. |
| F.o.b. Birmingham | 2.20c. |
| F.o.b. cars dock Gulf ports | 2.45c. |
| F.o.b. cars Pacific ports | 2.60c. |

*Rail Steel*

(For merchant trade)

| | |
|---|---|
| F.o.b. Pittsburgh | 1.90c. |
| F.o.b. Cleveland, Chicago, Gary or Moline, Ill. | 1.95c. |
| F.o.b. Buffalo | 2.00c. |
| F.o.b. Birmingham | 2.05c. |
| F.o.b. cars dock Gulf ports | 2.30c. |
| F.o.b. cars dock Pacific ports | 2.45c. |

*Billet Steel Reinforcing*

(Straight lengths as quoted by distributors)

| | |
|---|---|
| F.o.b. Pittsburgh | 2.05c. |
| F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham | 2.10c. |
| Del'd Detroit | 2.20c. |
| F.o.b. cars dock Gulf ports | 2.45c. |
| F.o.b. cars dock Pacific ports | 2.45c. |

*Rail Steel Reinforcing*

(Straight lengths as quoted by distributors)

| | |
|---|---|
| F.o.b. Pittsburgh | 1.90c. |
| F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham | 1.95c. |
| F.o.b. cars dock Gulf ports | 2.30c. |
| F.o.b. cars dock Pacific ports | 2.30c. |

*Iron*

| | |
|---|---|
| F.o.b. Chicago | 1.80c. |
| F.o.b. Pittsburgh (refined) | 2.10c. |
| Delivered New York | 2.05c. |
| Delivered Philadelphia | 2.10c. |

### Cold Finished Bars and Shafting*

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 2.35c. |
| F.o.b. Cleveland, Chicago and Gary | 2.40c. |
| F.o.b. Buffalo | 2.45c. |
| Del'd Detroit | 2.50c. |
| Del'd eastern Michigan | 2.55.c |

*In quantities of 10,000 to 19,999 lb.

### Plates

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 1.90c. |
| F.o.b. Chicago or Gary | 1.95c. |
| Del'd Cleveland | 2.095c. |
| F.o.b. Coatesville or Spar. Pt. | 2.00c. |
| Del'd Philadelphia | 2.09c. |
| Del'd New York | 2.19c. |
| F.o.b. Birmingham | 2.05c. |
| F.o.b. cars dock Gulf ports | 2.30c. |
| F.o.b. cars dock Pacific ports | 2.45c. |
| Wrought iron plates, f.o.b. Pittsburgh | 3.20c. |

### Floor Plates

| | |
|---|---|
| F.o.b. Pittsburgh | 3.45c. |
| F.o.b. Chicago | 3.50c. |
| F.o.b. Coatesville | 3.55c. |
| F.o.b. cars dock Gulf ports | 3.85c. |
| F.o.b. cars dock Pacific ports | 4.00c. |

### Structural Shapes

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 1.90c. |
| F.o.b. Chicago | 1.95c. |
| Del'd Cleveland | 2.095c. |
| F.o.b. Buffalo or Bethlehem | 2.00c. |
| Del'd Philadelphia | 2.115c. |
| Del'd New York | 2.1625c. |
| F.o.b. Birmingham (standard) | 2.05c. |
| F.o.b. cars dock Gulf ports | 2.30c. |
| F.o.b. cars dock Pacific ports | 2.45c. |

### Steel Sheet Piling

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 2.25c. |
| F.o.b. Chicago or Buffalo | 2.35c. |
| F.o.b. cars dock Gulf or Pacific Coast ports | 2.70c. |

## RAILS AND TRACK SUPPLIES

### F.o.b. Mill

| | |
|---|---|
| Standard rails, heavier than 60 lb per gross ton | $36.37½ |
| Angle bars, per 100 lb. | 2.55 |

### F.o.b. Code Basing Points

| | |
|---|---|
| Light rails (from billets) per gross ton | $35.00 |
| Light rails (from rail steel) per gross ton | 34.00 |

| | *Base per 100 Lb.* |
|---|---|
| Spikes | 2.75c. |
| Tie plates, steel | 2.00c. |
| Tie plates, Pacific Coast ports | 2.10c. |
| Track bolts, to steam railroads | 3.75c. |
| Track bolts, to jobbers, all sizes (per 100 counts) 70 per cent off list | |

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va.

## SHEETS, STRIP, TIN PLATE, TERNE PLATE

### Sheets

*Hot Rolled*

| | *Base per Lb.* |
|---|---|
| No. 10, f.o.b. Pittsburgh | 1.95c. |
| No. 10, f.o.b. Gary | 2.05c. |
| No. 10, del'd Detroit | 2.15c. |
| No. 10, del'd Philadelphia | 2.26c. |
| No. 10, f.o.b. Birmingham | 2.10c. |
| No. 10, f.o.b. cars dock Pacific ports | 2.50c. |

*Hot-Rolled Annealed*

| | |
|---|---|
| No. 24, f.o.b. Pittsburgh | 2.60c. |
| No. 24, f.o.b. Gary | 2.70c. |
| No. 24, del'd Detroit | 2.80c. |
| No. 24, del'd Philadelphia | 2.91c. |
| No. 24, f.o.b. Birmingham | 2.75c. |
| No. 24, f.o.b. cars dock Pacific ports | 3.25c. |
| No. 24, wrought iron, Pittsburgh | 4.30c. |

*Heavy Cold-Rolled*

| | |
|---|---|
| No. 10 gage, f.o.b. Pittsburgh | 2.60c. |
| No. 10 gage, f.o.b. Gary | 2.70c. |
| No 10 gage, f.o.b. Detroit | 2.80c. |
| No. 10 gage, del'd Philadelphia | 2.91c. |
| No. 10 gage, f.o.b. Birmingham | 2.75c. |
| No. 10 gage, f.o.b. cars dock Pacific ports | 3.20c. |

*Light Cold-Rolled*

| | |
|---|---|
| No. 20 gage, f.o.b. Pittsburgh | 3.05c. |
| No. 20 gage, f.o.b. Gary | 3.15c. |
| No. 20 gage, del'd Detroit | 3.25c. |
| No. 20 gage, del'd Philadelphia | 3.36c. |
| No. 20 gage, f.o.b. Birmingham | 3.20c. |
| No. 20 f.o.b. cars dock Pacific ports | 3.60c. |

*Galvanized Sheets*

| | |
|---|---|
| No. 24 gage, f.o.b. Pittsburgh | 3.20c. |
| No. 24, f.o.b. Gary | 3.30c. |
| No. 24, del'd Philadelphia | 3.51c. |
| No. 24, f.o.b. Birmingham | 3.35c. |
| No. 24, f.o.b. cars dock Pacific ports | 3.80c. |
| No. 24, wrought iron, Pittsburgh | 4.95c. |

### Electrical Sheets

*(F.o.b. Pittsburgh)*

| | *Base per Lb.* |
|---|---|
| Field grade | 3.00c. |
| Armature | 3.35c. |
| Electrical | 3.85c. |
| Special Motor | 4.90c. |
| Special Dynamo | 5.60c. |
| Transformer | 6.10c. |
| Transformer Special | 7.10c. |
| Transformer Extra Special | 7.60c. |

*Silicon Strip in coils—Sheet price plus silicon sheet extra width extras, plus 25c. per 100 lb. for coils.*

*Long Ternes*

| | |
|---|---|
| No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh | 3.50c. |
| F.o.b. Gary | 3.60c. |
| F.o.b. cars dock Pacific ports | 4.20c. |

*Vitreous Enameling Stock*

| | |
|---|---|
| No. 20, f.o.b. Pittsburgh | 3.05c. |
| No. 20, f.o.b. Gary | 3.15c. |
| No. 20, f.o.b. Birmingham | 3.65c. |
| No. 20, f.o.b. cars dock Pacific ports | 3.65c. |

*Tin Mill Black Plate*

| | |
|---|---|
| No. 28, f.o.b. Pittsburgh | 2.75c |
| No. 28, Gary | 2.85c |
| No. 28, cars dock Pacific ports | 3.35c. |

### Tin Plate

| | *Base per Box* |
|---|---|
| Standard cokes, f.o.b. Pittsburgh district mill | $5.25 |
| Standard cokes, f.o.b. Gary | 5.35 |
| Standard cokes, f.o.b. cars dock Pacific ports | 5.90 |

### Terne Plate

*(F.o.b. Pittsburgh)*

(Per Package, 20 x 28 in.)

| | |
|---|---|
| 8-lb. coating I.C. | $10.00 |
| 15-lb. coating I.C. | 12.00 |
| 20-lb. coating I.C. | 13.00 |
| 25-lb. coating I.C. | 14.00 |
| 30-lb. coating I.C. | 15.25 |
| 40-lb. coating I.C. | 17.50 |

### Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

| | *Base per Lb.* |
|---|---|
| All widths up to 24 in., P'gh | 1.95c. |
| All widths up to 24 in., Chicago | 2.05c. |
| All widths up to 24 in., del'd Detroit | 2.15c. |
| All widths up to 24 in., Birmingham | 2.10c. |
| Cooperage stock, Pittsburgh | 2.05c. |
| Cooperage stock, Chicago | 2.15c. |

### Cold-Rolled Strips*

| | *Base per Lb.* |
|---|---|
| F.o.b. Pittsburgh | 2.60c. |
| F.o.b. Cleveland | 2.60c. |
| Del'd Chicago | 2.895c. |
| F.o.b. Worcester | 2.80c. |

* Carbon 0.25 and less.

### Cold-Rolled Spring Steel

| | Pittsburgh and Cleveland | Worcester |
|---|---|---|
| Carbon 0.25-0.50% | 2.60c. | 2.80c. |
| Carbon .51- .75 | 3.70c. | 3.90c. |
| Carbon .76-1.00 | 5.45c. | 5.65c. |
| Carbon Over 1.00 | 7.50c. | 7.70c. |

*Fender Stock*

| | |
|---|---|
| No. 14, Pittsburgh or Cleveland | 2.90c. |
| No. 14, Worcester | 3.30c. |
| No. 20, Pittsburgh or Cleveland | 3.30c. |
| No. 20, Worcester | 3.70c. |

## WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

*To Manufacturing Trade*

| | *Per Lb.* |
|---|---|
| Bright wire | 2.50c. |
| Spring wire | 3.05c. |

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

*To the Trade*

| | *Base per Keg* |
|---|---|
| Standard wire nails | $2.05 |
| Smooth coated nails | 2.05 |

| | *Base per 100 Lb.* |
|---|---|
| Annealed fence wire | $2.80 |
| Galvanized fence wire | 3.15 |
| Polished staples | 2.75 |
| Galvanized staples | 3.00 |
| Barbed wire, galvanized | 2.55 |
| Twisted barbless wire | 2.55 |
| Woven wire fence, base column | 60 |
| Single loop bale ties, base column | 52 |

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh except for woven wire fence, which is $3 over Pittsburgh and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

## STEEL AND WROUGHT IRON PIPE AND TUBING

### Welded Pipe

**Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills**

F.o.b. Pittsburgh only on wrought iron pipe.

*Butt Weld*

| *Steel* In. | Black | Galv. | *Wrought Iron* In. | Black | Galv. |
|---|---|---|---|---|---|
| ⅛ | .....57 | 37 | ⅛ | ..+91½ | +138 |
| ¼ to ⅜ | .60 | 44½ | ¼ & ⅜ | +1½ | +21½ |
| ½ | .....64½ | 55 | ½ | .....31½ | 15 |
| ¾ | .....67½ | 59 | ¾ | .....36½ | 20½ |
| 1 to 3 | ...69½ | 61½ | 1 & 1¼ | .39½ | 25½ |
| | | | 1½ | .....43½ | 28 |
| | | | 2 | .....41½ | 26 |

*Lap Weld*

| | | | | | |
|---|---|---|---|---|---|
| 2 | .....62 | 53½ | 2 | .....37 | 22½ |
| 2½ to | 3.65 | 56½ | 2½ to 3½ | 38 | 25 |
| 3½ to | 6.67 | 58½ | 4 to 8 | ...40 | 28½ |
| 7 & | 8.66 | 56½ | 9 to 12 | ..38 | 24½ |
| 9 & | 10.65½ | 56 | | | |
| 11 & | 12.64½ | 55 | | | |

*Butt Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| ⅛ | .....55½ | 42½ | ⅛ | ...+13 | +45½ |
| ¼ to ⅜ | .57½ | 46½ | ¼ & ⅜ | +2½ | +34½ |
| ½ | .....62½ | 54½ | ½ | .....32½ | 17½ |
| ¾ | .....66½ | 58½ | ¾ | .....37½ | 22½ |
| 1 to 3 | ...68 | 61 | 1 to 2 | ..43½ | 29 |

*Lap Weld, extra strong, plain ends*

| | | | | | |
|---|---|---|---|---|---|
| 2 | .....60 | 52½ | 2 | .....40 | 26 |
| 2½ to | 3.64 | 56½ | 2½ to | 4.45½ | 33 |
| 3½ to | 6.67½ | 60 | 4½ to | 6.45 | 33½ |
| 7 & | 8..66½ | 57 | 7 & | 8 .46 | 33 |
| 9 & | 10..65½ | 56 | 9 to | 12.41½ | 30 |
| 11 & | 12..64½ | 55 | | | |

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

### Boiler Tubes

*Seamless Steel Commercial Boiler Tubes and Locomotive Tubes*

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

| | | Cold Drawn | Hot Rolled |
|---|---|---|---|
| 1 in. o.d. | 13 B.W.G. | $ 8.60 | $ 7.82 |
| 1¼ in. o.d. | 13 B.W.G. | 10.19 | 9.26 |
| 1½ in. o.d. | 13 B.W.G. | 11.26 | 10.23 |
| 1¾ in. o.d. | 13 B.W.G. | 12.81 | 11.64 |
| 2 in. o.d. | 13 B.W.G. | 14.35 | 13.04 |
| 2¼ in. o.d. | 13 B.W.G. | 16.00 | 14.54 |
| 2¼ in. o.d. | 12 B.W.G. | 17.61 | 16.01 |
| 2½ in. o.d. | 12 B.W.G. | 19.29 | 17.54 |
| 2¾ in. o.d. | 12 B.W.G. | 20.45 | 18.59 |
| 3 in. o.d. | 12 B.W.G. | $21.45 | $19.50 |
| 4½ in. o.d. | 10 B.W.G. | 41.08 | 37.35 |
| 3½ in. o.d. | 11 B.W.G. | 27.09 | 24.62 |
| 4 in. o.d. | 10 B.W.G. | 33.60 | 30.54 |
| 4½ in. o.d. | 10 B.W.G. | 41.08 | 37.35 |
| 5 in. o.d. | 9 B.W.G. | 51.56 | 46.87 |
| 6 in. o.d. | 7 B.W.G. | 79.15 | 71.90 |

Extra for less-carload quantities:

| | | | | |
|---|---|---|---|---|
| 25,000 lb. or ft. to | 39,999 lb. or ft. | 5 | % |
| 12,000 lb. or ft. to | 24,999 lb. or ft. | 12½ | % |
| 6,000 lb. or ft. to | 11,999 lb. or ft. | 25 | % |
| 2,000 lb. or ft. to | 5,999 lb. or ft. | 35 | % |
| Under 2,000 lb. or ft. | | 50 | % |

## CAST IRON WATER PIPE

*Per Net Ton*

| | |
|---|---|
| *6-in. and larger, del'd Chicago. | $48.40 |
| 6-in. and larger, del'd New York | 45.20 |
| *6-in. and larger, Birmingham | 40.00 |
| 6-in. and larger, f.o.b. dock, San Francisco or Los Angeles | 48.00 |
| F.o.b. dock, Seattle | 40.50 |
| F.o.b. dock, Seattle | 51.50 |

Class "A" and gas pipe, $3 extra.
4-in. pipe is $3 a ton above 6-in.

* Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $39. Birmingham, and $47.40, delivered Chicago and 4-in. pipe, $42, Birmingham, and $50.40 a ton, delivered Chicago.

## BOLTS, NUTS, RIVETS, SET SCREWS

### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

*Per Cent Off List*

| | |
|---|---|
| Machine and carriage bolts: | |
| ½ in. x 6 in. and smaller | 70 and 10 |
| Larger than ½ in. | 70 and 5 |
| Lag bolts | 70 and 5 |
| Plow bolts, Nos. 1, 2, 3, and 7 heads | 70 and 5 |
| Hot-pressed nuts, blank or tapped, square | 70 and 5 |
| Hot-pressed nuts, blank or tapped, hexagon | 70 and 5 |
| C.p.c. and t. square or hex. nuts, blank or tapped | 70 and 5 |
| Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes | 60, 20 and 10 |
| Stove bolts in packages, nuts attached | 75 |
| Stove bolts in packages, with nuts separate | 75 and 5 |
| Stove bolts in bulk | 82½ |
| Tire bolts | 50 and 5 |

On stove bolts freight is allowed to destination on 200 lb. and over.

### Large Rivets

(½-in. and larger)

*Base per 100 Lb.*

| | |
|---|---|
| F.o.b. Pittsburgh or Cleveland | $3.05 |
| F.o.b. Chicago or Birmingham | 3.15 |

### Small Rivets

(7/16-in. and smaller)

*Per Cent Off List*

| | |
|---|---|
| F.o.b. Pittsburgh | 70 and 5 |
| F.o.b. Cleveland | 70 and 5 |
| F.o.b. Chicago and Birm'g'm. | 70 and 5 |

### Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

*Per Cent Off List*

| | |
|---|---|
| Milled cap screws, 1 in. dia. and smaller | 80, 10 and 10 |
| Milled standard set screws, case hardened, 1 in. dia. and smaller | 75 |
| Milled headless set screws, cut thread ¾ in. and smaller | 75 |
| Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller | 60 |
| Upset set screws, cup and oval points | 75 |
| Milled studs | 65 to 65 and 10 |

# Alloy and Stainless Steel

### Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $51 a gross ton.

### Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base..... 2.55c.
Delivered price at Detroit is.. 2.70c.

| S.A.E. Series Numbers | Alloy Differential per 100 lb. |
|---|---|
| 2000 (½% Nickel) | $0.25 |
| 2100 (2½% Nickel) | 0.95 |
| 2300 (3½% Nickel) | 1.50 |
| 2500 (5% Nickel) | 2.25 |
| 3100 Nickel Chromium | 0.55 |
| 3200 Nickel Chromium | 1.35 |
| 3300 Nickel Chromium | 3.80 |
| 3400 Nickel Chromium | 3.20 |
| 4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum) | 0.50 |
| 4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum) | 0.70 |
| 4600 Nickel Molybdenum (0.20 to 0.30) Molybdenum (1.50 to 2.00 Nickel) | 1.05 |
| 5100 Chromium Steel (0.60 to 0.90 Chromium) | 0.35 |
| 5100 Chromium Steel (0.80 to 1.10 Chromium) | 0.45 |
| 5100 Chromium Spring Steel | ...base |
| 6100 Chromium Vanadium Bar | 1.10c. |
| 6100 Chromium Vanadium Spring Steel | 0.70 |
| Chromium Nickel Vanadium | 1.40 |
| Carbon Vanadium | 0.85 |

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

### Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.05c. base per lb. Delivered Detroit, 3.20c.

## STAINLESS STEEL No. 302

(17 to 19% Cr, 7 to 9% Ni, 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

| | *Per Lb.* |
|---|---|
| Forging billets | 19.55c. |
| Bars | 23c. |
| Plates | 26c. |
| Structural shapes | 23c. |
| Sheets | 33c. |
| Hot-rolled strip | 20¾c. |
| Cold-rolled strip | 27c. |
| Drawn wire | 23c. |

## TOOL STEEL

| | *Base per Lb.* |
|---|---|
| High speed | 57½c. |
| High carbon chrome | 37c. |
| Oil hardening | 21c. |
| Special | 19c. |
| Extra | 15¾c. |
| Regular | 12½c. |

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

# British and Continental

## BRITISH

**Per Gross Ton**
**f.o.b. United Kingdom Ports**

Based on Exchange rate as of Sept. 25

| | |
|---|---|
| Ferromanganese, export | $45.58 |
| Billets, open-hearth | 29.74 to $31.01 |
| Tin plate, per base box | 4.74 to 4.84 |
| Steel bars, open-hearth | 39.87 |
| Beams, open-hearth | 38.61 |
| Channels, open-hearth | 39.87 |
| Angles, open-hearth | 38.61 |
| Black sheets, No. 24 gage | 51.90 |
| Galvanized sheets, No. 24 gage | 61.92 |

## CONTINENTAL

**Per Metric Ton, f.o.b. Continental Ports**

Based on Exchange rate of Sept. 25

| | |
|---|---|
| Billets, Thomas | $19.27 |
| Wire rods, No. 5 B.W.G. | 36.90 |
| Steel bars, merchant | 26.64 |
| Sheet bars | 19.68 |
| Plate, ¼ in. and up | 35.42 |
| Plate, 3/16 in. and 5 mm | 34.85 |
| Sheets, ⅛ in. | 36.90 |
| Beams, Thomas | 25.58 |
| Angles (Basic) | 25.58 |
| Hoops and strip base | 32.79 |
| Wire, plain, No. 8 | 44.03 |
| Wire nails | 47.15 |
| Wire, barbed, 4 pt. No. 10 B.W.G. | 71.74 |

# IRON AND STEEL WAREHOUSE PRICES

## PITTSBURGH

| | *Base per Lb.* |
|---|---|
| Plates | 3.25c. |
| Structural shapes | 3.25c. |
| Soft steel bars and small shapes | 3.15c. |
| Reinforcing steel bars | 3.05c. |
| Cold-finished and screw stock: | |
| Rounds and hexagons | 3.60c. |
| Squares and flats | 3.60c. |
| Hot rolled strip incl. 3/16 in. thick, under 24 in. wide | 3.30c. |
| Hoops | 3.80c. |
| Hot-rolled annealed sheets (No. 24), 25 or more bundles | 3.45c. |
| Galv. sheets (No. 24), 25 or more bundles | 4.05c. |
| Hot-rolled sheets (No. 10) | 3.05c. |
| Galv. corrug. sheets (No. 28), per square (more than 3750 lb.) | $3.77 |
| Spikes, large | 3.25c. |
| | *Per Cent Off List* |
| Track bolts, all sizes, per 100 count | 60 |
| Machine bolts, 100 count | 65-5 |
| Carriage bolts, 100 count | 65-5 |
| Nuts, all styles, 100 count | 65-5 |
| Large rivets, base per 100 lb. | $3.65 |
| Wire, black, soft ann'l'd, base per 100 lb. | 2.90c. |
| Wire, galv. soft, base per 100 lb. | 3.25c. |
| Common wire nails, per keg | 2.35c. |
| Cement coated nails, per keg. | 2.35c. |

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

## CHICAGO

| | *Base per Lb.* |
|---|---|
| Plates and structural shapes. | 3.30c. |
| Soft steel bars, rounds | 3.20c. |
| Soft steel bars, squares and hexagons | 3.35c. |
| Cold-fin. steel bars: | |
| Rounds and hexagons | 3.75c. |
| Flats and squares | 3.75c. |
| Hot-rolled strip | 3.40c. |
| Hot-rolled annealed sheets (No. 24) | 4.05c. |
| Galv. sheets (No. 24) | 4.65c. |
| Spikes (keg lots) | 3.85c. |
| Track bolts (keg lots) | 4.85c. |
| Rivets, structural (keg lots) | 3.80c. |
| Rivets, boiler (keg lots) | 3.90c. |
| | *Per Cent Off List* |
| Machine bolts | *65 |
| Carriage bolts | *65 |
| Lag screws | *65 |
| Hot-pressed nuts, sq. tap or blank | *65 |
| Hot-pressed nuts, hex. tap or blank | *65 |
| Hex. head cap screws | 87½ |
| Cut point set screws | 75 and 10 |
| Flat head bright wood screws | 70 |
| Spring cotters | 55 |
| Stove bolts in full packages | 70 |
| Rd. hd. tank rivets, 7/16 in. and smaller | 57½ |
| Wrought washers | $4.50 off list |
| Black ann'l'd wire per 100 lb. | $3.95 |
| Com. wire nails, 50 kegs or more | 2.40c.† |
| Cement c't'd nails, 50 kegs or more | 2.40c.† |

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants wihtin the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

## NEW YORK

| | *Base per Lb.* |
|---|---|
| Plates, ¼ in. and heavier | 3.50c. |
| Structural shapes | 3.47c. |
| Soft steel bars, rounds | 3.51c. |
| Iron bars, Swed. charcoal | 6.75c. to 7.00c. |
| Cold-fin. shafting and screw stock: | |
| Rounds and hexagons | 4.06c. |
| Flats and squares | 4.06c. |
| Cold-rolled: strip, soft and quarter hard | 3.36c. |
| Hoops | 3.66c. |
| Bands | 3.66c. |
| Hot-rolled sheets (No. 10) | 3.15c. to 3.41c. |
| Hot-rolled ann'l'd sheets (No. 24*) | 3.75c. to 4.10c. |
| Galvanized sheets (No. 24*) | 4.10c. to 4.50c. |
| Long terne sheets (No. 24) | 5.25c. to 5.35c. |
| Armco iron, galv. (No. 24†) | 5.65c. |
| Toncan iron, galv. (No. 24†) | 5.65c. |
| Galvannealed (No. 24†) | 5.75c. |
| Armco iron, hot-rolled annealed (No. 24†) | 5.10c. |
| Toncan iron, hot-rolled annealed (No. 24†) | 5.10c. |
| Armco iron hot-rolled (No. 10†) | 4.15c. |
| Toncan iron, hot-rolled (No. 10†) | 4.15c. |
| Cold-rolled sheets (No. 20) less than 1000 lbs. | |
| Standard quality | 4.65c. |
| Deep drawing | 5.40c. |
| Stretcher leveled | 5.40c. |
| SAE, 2300, hot-rolled | 6.97c. |
| SAE, 3100, hot-rolled | 5.37c. |
| SAE, 6100, hot-rolled, annealed | 9.57c. |
| SAE, 2300, cold-rol'ed | 8.03c. |
| SAE, 3100, cold-rolled, annealed | 7.43c. |
| Floor plate ⅛ in. and heavier | 5.30c. |
| Standard tool steel | 11.25c. |
| Wire, black annealed (No. 9) | 3.50c. |
| Wire, galv. (No. 9) | 3.85c. |
| Tire steel, 1 x ½ in. and larger | 3.85c. |
| Open-hearth spring steel | 4.00c. to 10.00c. |
| Common wire nails, base per keg | $3.21 |
| | *Per Cent Off List* |
| Machine bolts, square head and nut: | |
| All diameters | 65 and 10 |
| Carriage bolts, cut thread: | |
| All diameters | 65 and 10 |

* No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

† 125 lb. and more.

## ST. LOUIS

| | *Base per Lb.* |
|---|---|
| Plates and struc. shapes | 3.55c. |
| Bars, soft steel (rounds and flats) | 3.35c. |
| Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds) | 3.50c. |
| Cold-fin. rounds, shafting, screw stock | 3.90c. |
| Hot-rolled annealed sheets (No. 24) | 4.20c. |
| Galv. sheets (No. 24) | 4.90c. |
| Hot-rolled sheets (No. 10) | 3.40c. |
| Black corrug. sheets (No. 24) | 4 20c. |
| *Galv. corrug. sheets | 4.90c. |
| Structural rivets | 4.00c. |
| Boiler rivets | 4.10c. |
| | *Per Cent Off List* |
| Tank rivets, 7/16 in. and smaller. | 55 |
| Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities | 70 |

*No. 26 and lighter take special prices.

## PHILADELPHIA

| | *Base per Lb.* |
|---|---|
| *Plates, ¼-in. and heavier | 3.10c. |
| *Structural shapes | 3.10c. |
| *Soft steel bars, small shapes, iron bars (except bands) | 3.15c. |
| ‡Reinforc. steel bars, sq. twisted and deformed | 2.96c. |
| Cold-finished steel bars | 3.91c. |
| *Steel hoops | 3.55c. |
| *Steel bands, No. 12 and 3/16 in. incl. | 3.30c. |
| Spring steel | 5.00c. |
| †Hot-rolled anneal. sheets (No. 24) | 3.75c. |
| †Galvanized sheets (No. 24) | 4.50c. |
| *Hot-rolled annealed sheets (No. 10) | 3.20c. |
| Diam. pat. floor plates, ¼ in. | 5.05c. |
| Swedish iron bars | 6.25c. |

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

## CLEVELAND

| | *Base per Lb.* |
|---|---|
| Plates and struc. shapes | 3.41c. |
| Soft steel bars | 3.10c. |
| ‡Reinforc. steel bars | 2.10c. |
| †Cold-finished steel bars | 3.75c. |
| Flat-rolled steel under ¼ in. | 3.46c. |
| Cold-finished strip | †3.00c. |
| Hot-rolled annealed sheets (No. 24) | 3.91c. |
| Galvanized sheets (No. 24) | 4.61c. |
| Hot-rolled sheets (No. 10) | 3.21c. |
| Hot-rolled 3/16 in. 24 to 48 in. wide sheets | 3.46c. |
| *Black ann'l'd wire, per 100 lb. | $2.80 |
| *No. 9 galv. wire, per 100 lb. | 3.15 |
| *Com. wire nails, base per keg | 2.25 |

†Outside delivery 10c. less.

*For 5000 lb. or less.

‡Plus switching and cartage charges and quantity differentials up to 50c.

## CINCINNATI

| | *Base per Lb.* |
|---|---|
| Plates and struc. shapes | 3.52c. |
| Bars, rounds, flats and angles. | 3.32c. |
| Other shapes | 3.47c. |
| Rail steel reinforc. bars | 3.25c. |
| Hoops and bands, 3/16 in. and lighter | 3.57c. |
| Cold-finished bars | 3.87c. |
| Hot-rolled annealed sheets (No. 24) 25 bundles or more. | 4.62c. |
| Galv. sheets (No. 24) 500 lb. or less | 4.47c. |
| Galvanized sheets (No. 24) over 3500 lb. | 4.07c. |
| Hot-rolled sheets (No. 10) | 3.32c. |
| Structural rivets | 4.50c. |
| Small rivets | 55 per cent off list |
| No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over) | $2.88 |
| Com. wire nails, base per keg: | |
| Any quantity less than carload. | 3.04 |
| Cement c't'd nails, base 100-lb keg | 3.50 |
| Chain, lin. per 100 lb | 8.35 |
| | *Net per 100 Ft.* |
| Seamless steel boiler tubes, 2-in. | $20.37 |
| 4-in. | 48.14 |
| Lap-welded steel boiler tubes, 2-in. | 19.38 |
| 4-in. | 45.32 |

## BUFFALO

| | *Base per Lb.* |
|---|---|
| Plates | 3.48c. |
| Struc. shapes | 3.35c. |
| Soft steel bars | 3.15c. |
| Reinforcing bars | 2.60c. |
| Cold-fin. flats and sq. | 3.70c. |
| Rounds and hex. | 3.70c. |
| Cold-rolled strip steel | 3.19c. |
| Hot-rolled annealed sheets (No. 24) | 4.16c. |
| Heavy hot-rol'ed sheets (3/16 in., 24 to 48 in. wide) | 3.53c. |
| Galv. sheet (No. 24) | 4.80c. |
| Bands | 3.53c. |
| Hoops | 3.53c. |
| Heavy top-rolled sheets | 3.28c. |
| Com. wire nails, base per keg. | $2.85 |
| Black wire, base per 100 lb. (2500-lb. lots or under) | 4.00 |
| (Over 2500 lb.) | 3.90 |

## BOSTON

| | *Base per Lb.* |
|---|---|
| Beams, channels, angles | 3.65c. |
| Tees and zees, under 3" | 3.90c. |
| H beams and shapes | 3.64c. |
| Plates — Sheared, tank, and univ. mill, ¼ in. thick and heavier | 3.66c. |
| Floor plates, diamond pattern | 5.46c. |
| Bar and bar shapes (mild steel) | 3.65c. |
| Bands 3/16 in. thick and No. 12 ga. incl. | 2.75c. to 4.75c. |
| Half rounds, half ovals, ovals and bevels | 4.90c. |
| Tire steel | 4.90c. |
| Cold-rolled strip steel | 3.245c. |
| Cold-finished rounds, squares and hexagons | 4.05c. |
| Cold-finished flats | 4.05c. |
| Blue annealed sheets, No. 10 ga. | 3.75c. |
| One pass cold-rolled sheets No. 24 ga. | 4.30c. |
| Galvanized steel sheets, No. 24 ga. | 4.30c. |
| Lead coated sheets, No. 24 ga. | 5.85c. |

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

## DETROIT

| | *Base per Lb.* |
|---|---|
| Soft steel bars | 3.29c. |
| Structural shapes | 3.52c. |
| Plates | 3.52c. |
| Floor plates | 5.27c. |
| Hot-rolled annealed sheets (No. 24)* | 4.14c. |
| Hot-rolled sheets (No. 10)** | 3.24c. |
| Galvanized sheets (No. 24) | 4.82c. |
| Bands | 3.49c. |
| Hoops | 3.49c. |
| †Cold-finished bars | 3.84c. |
| Cold-rolled strip | 3.18c. |
| Hot-rolled alloy steel (S.A.E. 3100 Series) | 5.44c. |
| Bolts and nuts, in cases, 70 and 10 per cent off list | |
| Broken cases...65 and 10 per cent off | |

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

* Base less 0.25c., 3500 lb. and over. Add 0.50c. per hundred lb. for broken bundles.

** Base less 0.25c., 1500 to 3749 lbs.; less 0.50c., 3750 to 7499 lb.; less 0.75c., 7500 lb. and over.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

Country territory to be equalized on the Chicago plan.

## MILWAUKEE

| | *Base per Lb.* |
|---|---|
| Plates and structural shapes.. | 3.41c. |
| Soft steel bars, rounds up to 8 in., flats and fillet angles.... | 3.31c. |
| Soft steel bars, squares and hexagons | 3.46c. |
| Hot-rolled strip | 3.51c. |
| Hot-rolled sheets (No. 10).... | 3.26c. |
| Hot-rolled annealed sheets (No. 24) | 4.16c. |
| Galvanized sheets (No. 20) .. | 4.76c. |
| Cold-finished steel bars..... | 3.76c. |
| Cold-rolled strip | 3.33c. |
| Structural rivets (keg lots)... | 4.01c. |
| Boiler rivets, cone head (keg lots) | 4.11c. |
| Track spikes (keg lots) ..... | 4.06c. |
| Track bolts (keg lots) ..... | 5.06c. |
| Black annealed wire ..... | 3.40c. |
| Com. wire nails ..... | 2.60c. |
| Cement coated nails ..... | 2.60c. |

| | *Per Cent Off List* |
|---|---|
| Machine bolts, carriage bolts and lag screws | 70 to 75 |
| Hot-pressed nuts, sq. and hex. tapped or blank (keg lots) | 70 |

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

## ST. PAUL

| | *Base per Lb.* |
|---|---|
| Mild steel bars, rounds | 3.45c. |
| Structural shapes | 3.55c. |
| Plates | 3.55c. |
| Cold-finished bars | 4.00c. |
| Bands and hoops | 3.65c. |
| Hot-rolled annealed sheets, No. 24 | 4.30c. |
| Galvanized sheets, No. 24..... | 4.90c. |

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

## BALTIMORE

| | *Base per Lb.* |
|---|---|
| Mild Steel bars and small shapes | 3.10c. |
| Structural shapes | 3.10c. |
| Reinforcing bars | ....prices on application |
| Plates | 3.10c. |
| Hot-rolled sheets, No. 10..... | 3.20c. |
| Bands | 3.30c. |
| Hoops | 3.55c. |
| Special threading steel..... | 3.20c. |
| Diamond pattern floor plates ¼ in. and heavier | 5.10c. |
| Galvanized bars and small shapes | 5.60c. |
| Galvanized bands | 5.80c. |
| Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more | 3.88c. |

All prices are for 2000 lb. and more.

For second zone add 10c. per 100 lb. for trucking.

List size extras of Aug. 15, 1935, and cutting extras to be added.

For cold-rolled products, list size extras from Jan. 1, 1936, and cutting extras to be added.

## CHATTANOOGA

| | *Base per Lb.* |
|---|---|
| Mild steel bars | 3.46c. |
| Iron bars | 3.46c. |
| Reinforcing bars | 3.46c. |
| Structural shapes | 3.66c. |
| Plates | 3.66c. |
| Hot-rolled sheets No. 10..... | 3.46c. |
| Hot-rolled annealed sheets No. 24* | 3.41c. |
| Galvanized sheets, No. 24*.... | 3.96c. |
| Steel bands | 3.71c. |
| Cold-finished bars | 4.281c. |

* Plus mill item extra.

## MEMPHIS

| | *Base per Lb.* |
|---|---|
| Mild steel bars | 3.57c. |
| Shapes, bar size | 3.57c. |
| Iron bars | 3.57c. |
| Structural shapes | 3.77c. |
| Plates | 3.77c. |
| Hot-rolled sheets, No. 10..... | 3.57c. |
| Hot-rolled annealed sheets, No. 24 | 4.37c. |
| Galvanized sheets, No. 24.... | 5.07c. |
| Steel bands | 3.82c. |
| Cold-drawn rounds | 4.04c. |
| Cold-drawn flats, squares, hexagons | 6.04c. |
| Structural rivets | 4.25c. |
| Bolts and nuts, per cent off list | 65 |
| Small rivets, per cent off list. | 50 |

## NEW ORLEANS

| | *Base per Lb.* |
|---|---|
| Mild steel bars | 3.45c. |
| Reinforcing bars | 3.50c. |
| Structural shapes | 3.65c. |
| Plates | 3.65c. |
| Hot-rolled sheets, No. 10..... | 3.65c. |
| Hot-rolled annealed sheets, No. 24 | 4.35c. |
| Galvanized sheets, No. 24..... | 4.95c. |
| Steel bands | 4.05c. |
| Cold-finished steel bars | 4.55c. |
| Structural rivets | 4.25c. |
| Boiler rivets | 4.25c. |
| Common wire nails, base per keg | $2.45 |
| Bolts and nuts, per cent off list | 70 |

## PACIFIC COAST

| | Base per Lb. San Francisco | Los Angeles | Seattle |
|---|---|---|---|
| Plates, tank and U. M. | 3.60c. | 3.80c. | 3.55c. |
| Shapes, standard | 3.60c. | 3.80c. | 3.55c. |
| Soft steel bars.. | 3.60c. | 3.80c. | 3.70c. |
| Reinforcing bars, f.o.b. cars dock Pacific ports.. | 2.45c. | 2.45c. | 2.45c. |
| Hot-rolled annealed sheets (No. 24) | 4.30c. | 4.35c. | 4.40c. |
| Hot-rolled sheets (No. 10) | 3.70c. | 3.90c. | 3.75c. |
| Galv. sheets (No. 24 and lighter) | 5.00c. | 4.60c. | 5.00c. |
| Galv. sheets (No. 22 and heavier) | 5.00c. | 4.80c. | 5.00c. |
| Cold finished steel | | | |
| Rounds | 6.05c. | 6.10c. | 6.00c. |
| Squares and hexagons | 7.30c. | 7.35c. | 7.25c. |
| Flats | 7.80c. | 7.85c. | 8.25c. |
| Common wire nails—base per keg less carload | $2.90 | $2.90 | $2.90 |

All items subject to differentials for quantity.

# REFRACTORIES PRICES

### Fire Clay Brick

| | *Per 1000 f.o.b Works* |
|---|---|
| High-heat duty, Pennsylvania, Maryland, Kentucky, Missouri and Illinois | $45.00 |
| High-heat duty, New Jersey... | 50.00 |
| High-heat duty, Ohio | 40.00 |
| Intermediate, Pennsylvania, Maryland, Kentucky, Missouri and Illinois | 40.00 |
| Intermediate, New Jersey | 43.00 |
| Intermediate, Ohio | 35.00 |
| Ground fire clay, per ton | 7.00 |

### Silica Brick

| | *Per 1000 f.o.b Works* |
|---|---|
| Pennsylvania | $45.00 |
| Chicago District | 54.00 |
| Birmingham | $48 to 50.00 |
| Silica cement per net ton | 8.00 |

### Chrome Brick

| | *Per Net Ton* |
|---|---|
| Standard f.o.b. Baltimore, Plymouth Meeting and Chester | $45.00 |
| Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. | 45.00 |

### Magnesite Brick

| | *Per Net Ton* |
|---|---|
| Standard f.o.b. Baltimore and Chester, Pa. | $65.00 |
| Chemically bonded, f.o.b. Baltimore | 55.00 |

### Grain Magnesite

| | *Per Net Ton* |
|---|---|
| Imported, f.o.b. Baltimore and Chester, Pa. (in sacks) | $45.00 |
| Domestic, f.o.b. Baltimore and Chester, in sacks | 40.00 |
| Domestic, f.o.b. Chewelah, Wash. | 22.00 |

# RAW MATERIALS PRICES

## PIG IRON

**No. 2 Foundry**

| | |
|---|---|
| F.o.b. Everett, Mass.; Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md. | $20.50 |
| Delivered Brooklyn | 22.9289 |
| Delivered Newark or Jersey City | 21.9873 |
| Delivered Philadelphia | 21.3132 |
| F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill. | 19.50 |
| F.o.b. Jackson, Ohio | 21.25 |
| Delivered Cincinnati | 19.82 |
| F.o.b. Duluth | 20.00 |
| F.o.b. Provo, Utah | 17.50 |
| Delivered San Francisco, Los Angeles or Seattle | 22.315 |
| F.o.b. Birmingham* | 15.88 |

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of .70 and over.

**Malleable**

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

**Basic**

| | |
|---|---|
| F.o.b. Everett, Mass.; Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md. | $20.00 |
| Delivered Boston Switching District | 20.50 |
| Delivered Newark or Jersey City | 21.4873 |
| Delivered Philadelphia | 20.8132 |
| F.o.b. Buffalo | 18.50 |
| F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill. | 19.00 |
| Delivered Cincinnati | 18.82 |
| Delivered Canton, Ohio | 20.3482 |
| Delivered Mansfield, Ohio | 20.8832 |
| F.o.b. Jackson, Ohio | 20.75 |
| F.o.b. Provo, Utah | 17.00 |
| F.o.b. Birmingham | 14.50 |

**Bessemer**

| | |
|---|---|
| F.o.b. Everett, Mass.; Bethlehem, Birdsboro and Swedeland, Pa. | $21.50 |
| Delivered Boston Switching District | 22.00 |
| Delivered Newark or Jersey City | 22.9873 |
| Delivered Philadelphia | 22.3132 |
| F.o.b. Buffalo and Erie, Pa., and Duluth | 20.50 |
| F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago | 20.00 |
| F.o.b. Birmingham | 21.00 |
| Delivered Cincinnati | 21.0807 |
| Delivered Canton, Ohio | 21.3482 |
| Delivered Mansfield, Ohio | 21.8832 |

**Low Phosphorus**

| | |
|---|---|
| Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. | $24.00 |

**Gray Forge**

| | |
|---|---|
| Valley or Pittsburgh furnace | $19.00 |

**Charcoal**

| | |
|---|---|
| Lake Superior furnace | $22.50 |
| Delivered Chicago | 25.7528 |

**Canadian Pig Iron**

*Per Gross Ton*

Delivered Toronto.

| | |
|---|---|
| No. 1 fdy., sil. 2.25 to 2.75 | $21.00 |
| No. 2 fdy., sil. 1.75 to 2.75 | 20.50 |
| Malleable | 22.50 |

Delivered Montreal

| | |
|---|---|
| No. 1 fdy., sil. 2.25 to 2.75 | $22.50 |
| No. 2 fdy., sil. 1.75 to 2.25 | 22.00 |
| Malleable | 22.50 |
| Basic | 22.00 |

## FERROALLOYS

**Ferromanganese**

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

*Per Gross Ton*

| | |
|---|---|
| Domestic, 80% (carload) | $75.00 |

**Spiegeleisen**

*Per Gross Ton Furnace*

| | |
|---|---|
| Domestic, 19 to 21% | $26.00 |
| 50-ton lots 3-mo. shipment | 24.00 |
| F.o.b. New Orleans | 26.00 |

**Electric Ferrosilicon**

*Per Gross Ton Delivered*

| | |
|---|---|
| 50% (carloads) | $69.50 |
| 50% (ton lots) | 77.00 |
| 75% (carloads) | 126.00 |
| 75% (ton lots) | 136.00 |

**Silvery Iron**

*Per Gross Ton*

| | |
|---|---|
| F.o.b. Jackson, Ohio, 6.00 to 6.50% | $22.75 |

For each additional 0.5% silicon up to 17%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

**Bessemer Ferrosilicon**

*F.o.b. Jackson, Ohio, Furnace*

*Per Gross Ton*

| | |
|---|---|
| 10.00 to 10.50% | $27.75 |
| 10.51 to 11.00% | 28.25 |
| 11.00 to 11.50% | 28.75 |
| 11.51 to 12.00% | 29.25 |
| 12.01 to 12.50% | 29.75 |
| 12.51 to 13.00% | 30.25 |
| 13.01 to 13.50% | 30.75 |
| 13.51 to 14.00% | 31.25 |
| 14.01 to 14.50% | 31.75 |
| 14.51 to 15.00% | 32.25 |
| 15.01 to 15.50% | 32.75 |
| 15.51 to 16.00% | 33.25 |
| 16.01 to 16.50% | 33.75 |
| 16.51 to 17.00% | 34.25 |

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

**Other Ferroalloys**

| | |
|---|---|
| Ferrotungsten, per lb. contained W del., carloads | $1.30 |
| Ferrotungsten, lots of 5000 lb. | 1.35 |
| Ferrotungsten, smaller lots | 1.40 |
| Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract | 10.00c. |
| Ferrochromium, 2% carbon | 16.50c. to 17.00c. |
| Ferrochromium, 1% carbon | 17.50c. to 18.00c. |
| Ferrochromium, 0.10% carbon | 19.50c. to 20.00c. |
| Ferrochromium, 0.06% carbon | 20.00c. to 20.50c. |
| Ferrovanadium, del. per lb. contained V. | $2.70 to $2.90 |
| Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y. | $2.50 |
| Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton | $137.50 |
| Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton | 142.50 |
| Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton | 58.50 |
| Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with $3 unitage, freight equalized with Nashville, Tenn. | 75.00 |
| Ferromolybdenum, per lb. Mo del. | 95c. |
| Calcium molybdate, per lb. Mo del. | 80c. |
| Silico spiegel, per ton, f.o.b. furnace, carloads | $38.00 |
| Ton lots or less, per ton | 43.00 |
| Silico-manganese, gross ton, delivered. | |
| 2.50% carbon grade | 85.00 |
| 2% carbon grade | 90.00 |
| 1% carbon grade | 100.00 |

Note: Spot prices are $5 a ton higher except on 75 per cent ferrosilicon on which premium is $10 a ton.

## ORES

**Lake Superior Ores**

*Delivered Lower Lake Ports*

*Per Gross Ton*

| | |
|---|---|
| Old range, Bessemer, 51.50% | $4.80 |
| Old range, non-Bessemer, 51.50% | 4.65 |
| Mesabi, Bessemer, 51.50% | 4.65 |
| Mesabi, non-Bessemer, 51.50% | 4.50 |
| High phosphorus, 51.50% | 4.40 |

**Foreign Ore**

*C.i.f. Philadelphia or Baltimore*

*Per Unit*

| | |
|---|---|
| Iron, low phos., copper free, 55 to 58% dry Algeria | 12.50c. |
| Iron, low phos., Swedish, average, 68½% iron | Nominal |
| Iron, basic or foundry, Swedish, aver. 65% iron | 9.50c. |
| Iron, basic or foundry, Russian, aver. 65% iron | Nominal |
| Man., Caucasian, washed 52% | 27c. |
| Man., African, Indian, 44-48% | 25c. |
| Man., African, Indian, 49-51% | 26c. |
| Man., Brazilian, 46 to 48½% | Nominal 25c. |

*Per Net Ton Unit*

| | |
|---|---|
| Tungsten, Chinese, wolframite, duty paid delivered nominal | $15.25 to $15.50 |
| Tungsten, domestic, scheelite delivered, nominal | 15.00 |

*Per Gross Ton*

| | |
|---|---|
| Chrome, 45% $Cr_2O_3$, lump, c.i.f. Atlantic Seaboard (African) | $17.50 |
| 45 to 46% $Cr_2O_3$ (Turkish) | $16.50 to 17.00 |
| 48% $Cr_2O_3$ (African) | 20.50 |
| 48% min. $Cr_2O_3$ (Turkish) | 19.25 |
| Chrome concentrate, 50% and over $Cr_2O_3$, c.i.f. Atlantic ports | 22.00 |
| 52% $Cr_2O_3$ (Turkish) | 21.75 |
| 48 to 49% $Cr_2O_3$ (Turkish) | 19.25 |

## FLUORSPAR

*Per Net Ton*

| | |
|---|---|
| Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail | $18.00 |
| Domestic, barge and rail | 18.50 |
| No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines | 19.00 |
| Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid | 22.00 |
| Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines | 35.00 |

## FUEL OIL

*Per Gal.*

| | |
|---|---|
| F.o.b. Bayonne or Baltimore, No. 3 distillate | 4.25c. |
| F.o.b. Bayonne or Baltimore, No. 4 industrial | 3.75c. |
| Del'd Ch'go, No. 3 industrial | 5.00c. |
| Del'd Ch'go, No. 5 industrial | 3.77c. |
| Del'd Cleve'd, No. 3 distillate | 5.75c. |
| Del'd Cleve'd, No. 4 industrial | 5.50c. |
| Del'd Cleve'd, No. 5 industrial | 5.00c. |

## COKE AND COAL

**Coke**

*Per Net Ton*

| | |
|---|---|
| Furnace, f.o.b. Connellsville, Prompt | $3.75 to $4.00 |
| Foundry, f.o.b. Connellsville, Prompt | 4.25 to 5.75 |
| Foundry, by-product, Chicago ovens | 9.00 |
| Foundry, by-product, del'd New England | 11.50 |
| Foundry, by-product, del'd Newark or Jersey City | 9.60 to 10.05 |
| Foundry, by-product, Philadelphia | 9.38 |
| Foundry, by-product, delivered Cleveland | 9.75 |
| Foundry, by-product, delivered Cincinnati | 9.50 |
| Foundry, Birmingham | 6.50 |
| Foundry, by-product, St. Louis, f.o.b. ovens | 8.00 |
| Foundry, from Birmingham, f.o.b. cars docks, Pacific ports | 14.75 |

**Coal**

*Per Net Ton*

| | |
|---|---|
| Mine run steam coal, f.o.b. W. Pa. mines | $1.50 to $1.75 |
| Mine run coking coal, f.o.b. W. Pa. | 1.75 to 1.90 |
| Gas coal, ¾-in. f.o.b. Pa. mines | 2.00 to 2.25 |
| Mine run gas coal, f.o.b. Pa. mines | 1.80 to 2.00 |
| Steam slack, f.o.b. W. Pa. mines | 1.00 to 1.25 |
| Gas slack, f.o.b. W. Pa. mines | 1.20 to 1.45 |

FOR *High Quality Steels*

# NIAGARA
BRAND
# FERRO-ALLOYS

## PITTSBURGH METALLURGICAL CO., Inc.

NIAGARA FALLS, N. Y.

SALES OFFICES: NEW YORK—30 Church St. • PITTSBURGH—Oliver Bldg. • CLEVELAND—Hanna Bldg.

# FABRICATED STEEL

***. . . Awards in better volume at 20,450 tons compared with 9450 tons last week.***

o o o

***. . . New projects decline to 9700 tons as against 15,300 tons in the previous week.***

o o o

***. . . Plate lettings call for 1790 tons.***

### NORTH ATLANTIC STATES

**Biddeford-Saco, Me.,** 250 tons, State bridge, to Harris Structural Steel Co., Plainfield, N. J.

**Dresden, Me.,** 235 tons, State bridge, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

**Limington-Standish, Me.,** 200 tons, State bridge, to Boston Bridge Works, Inc.

**Bangor, Me.,** 170 tons, State bridge, to Boston Bridge Works, Inc.

**Clinton, Me.,** 155 tons, State bridge, to American Bridge Co.

**New York,** 410 tons, Government, column heads, Williamsburg housing project, to American Car & Foundry Co.

**New York,** 4610 tons, route 101, section 8, Sixth Avenue subway, to Bethlehem Steel Co.

**Weehawken, N. J.,** 800 tons, plaza construction, Hudson midtown tunnel, to American Bridge Co.

**Metuchen, N. J.,** 130 tons, highway bridge, to Bethlehem Steel Co.

**Ivy Rock, Pa.,** 125 tons, crane runway for Alan Wood Steel Co., to Belmont Iron Works, Eddystone, Pa.

**Shamokin, Pa.,** 400 tons, coal breaker, to Bethlehem Fabricators, Inc., Bethlehem, Pa.

**Ashley, Pa.,** 450 tons, Glen Alden Coal Co. boiler house, to Reading Metal Craft Co.

**Philadelphia,** 167 tons, building for Standard Baking Co., to Robinson Iron & Steel Co., Philadelphia.

**Philadelphia,** 120 tons, warehouse for H. F. Morris Co., to Morris-Wheeler Co.

**Baltimore,** 1500 tons, Owens-Illinois Can Co. factory building, to Bethlehem Steel Co.

**Washington,** 660 tons, Government printing warehouse No. 4, to Bethlehem Steel Co.

### SOUTH AND SOUTHWEST

**Sheffield, Ala.,** 1000 tons, spillway, to Lakeside Bridge & Steel Co., Milwaukee.

**Richmond, Tex.,** 630 tons, bridge, to Capital Steel & Iron Co.

**Yuma, Ariz.,** 180 tons, bridge, to John Beam, Denver.

### CENTRAL STATES

**Flint, Mich.,** 230 tons, loading dock for Chevrolet Motor Co., to R. C. Mahon Co., Detroit.

**Toledo, Ohio,** 613 tons, Wood County bridge to Bethlehem Steel Co.

**Chicago,** 615 tons, construction for Sinclair Refining Co., to Lackawanna Steel Construction Co.

**Chicago,** 480 tons, Baltimore & Ohio warehouse, to American Bridge Co.

**Chicago,** 2200 tons, South Ashland Avenue bridge, to Mount Vernon Bridge Co.

**Chicago,** 350 tons, Diversey housing project, to Bethlehem Steel Co.

**Gary, Ind.,** 210 tons, post office, to American Bridge Co.

**Peoria, Ill.,** 590 tons, building, to Mississippi Valley Structural Steel Co.

**Pulaski County, Mo.,** 236 tons, bridge, to Stupp Brothers Bridge & Iron Co., St. Louis.

### WESTERN STATES

**Fort Peck, Mont.,** 700 tons, trash racks, to O. J. O'Leary & Co.

**San Francisco,** 980 tons, State livestock building in San Mateo Co., to Bethlehem Steel Co.

**Los Angeles,** 325 tons, Carson and Dominiquez estates, Centinela Boulevard, to Bethlehem Fabricators, Inc.

**Los Angeles,** 420 tons, Western District high school, to Pacific Iron & Steel Co.

**Los Angeles County, Cal.,** 303 tons, three bridges for United States Engineers, to Bethlehem Fabricators, Inc.

## NEW STRUCTURAL STEEL PROJECTS

### NORTH ATLANTIC STATES

**Auburn-Lewiston, Me.,** 1200 tons, State bridge.

**Saugus, Mass.,** 160 tons, three State bridges.

**Millbury, Mass.,** 110 tons, State bridge.

**Sharon, Mass.,** 100 tons, State bridge.

**Waterville, Conn.,** 250 tons, addition to west side mill.

**New York,** 310 tons, alterations to building on East Thirty-fourth Street.

**New York,** 250 tons, Triborough bridge passageways.

**Rochester, N. Y.,** 950 tons, New York Central grade crossing elimination.

**Scottsville, N. Y.,** 310 tons, grade crossing elimination.

**Buffalo,** 2500 tons, Tifft Street viaduct; John W. Cowper, Inc., Buffalo, low bidder.

**Indiana County, Pa.,** 340 tons, highway bridge; old bids rejected; new bids Oct. 9.

**Clearfield County, Pa.,** 450 tons, highway bridge; bids Oct. 9.

**Cambria County, Pa.,** 200 tons, highway bridge; bids Oct. 9.

**Tamaqua, Pa.,** 100 tons, conveyor supports, Lehigh Navigation Coal Co.; Bethlehem Contracting Co., contractor.

**Safe Harbor, Pa.,** 1800 tons, transmission towers.

**Cumberland, Md.,** 250 tons, stockhouse for brewing company.

### THE SOUTH

**Birmingham,** 650 tons, store building.

### CENTRAL STATES

**Dearborn, Mich.,** 500 tons, American Blower Corp. factory addition.

**Reading, Ohio,** 700 tons, factory building.

**Cincinnati,** 500 tons, building.

**State of Wisconsin,** 900 tons, bridge No. 146, Boscobel; bids Oct. 9.

## FABRICATED PLATES

### AWARDS

**New York,** 780 tons, two oil barges, to Nashville Bridge Co.

**Paducah, Ky.,** 235 tons, welded pipe for United States Engineers, to Treadwell Construction Co.

**Ralston Creek Dam, Colo.,** 155 tons, welded pipe, to Thompson Mfg. Co.

**Imperial Dam, Cal.,** 420 tons, pipe for Bureau of Reclamation, to Southwest Welding & Mfg. Co.

**Baton Rouge, La.,** 200 tons, two tanks for Standard Oil Co., to Chicago Bridge & Iron Co.

### NEW PROJECTS

**Memphis, Tenn.,** 800 tons, pontoons and pipe.

**Beaver Dam, Wis.,** closes bids Oct. 5 on 400,000-gal. elevated steel water tank.

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## Carboloy Prices Sharply Reduced

CARBOLOY Company, Inc., Detroit, manufacturer of Carboloy cemented carbide, announces a reduction in prices of Carboloy for tools and blanks effective Oct. 1. The new price of Carboloy blanks for tool use will be based on 45c per gram in any size.

In addition to this substantial reduction in the price of carbide itself, a further reduction in tool manufacturing labor is also effective on single point tools in quantities of five or over on any given tool.

# THIS WEEK'S MACHINE . . .TOOL ACTIVITIES. . .

***. . . Domestic orders are somewhat spotty.***

o o o

***. . . Foreign orders feature sales during the week.***

o o o

***. . . Detroit tool and die shops may become active as fall machinery buyers.***

By L. M. WAITE

IN domestic markets machine sales continue to be light in mid-Western areas; small-tool sales, however, are very active. In Eastern areas, single-machine orders were generally well sustained and one or two large machines served to keep volume at approximately previous levels. In some instances orders counted for late September are not closing and are now expected to go over into October. In other instances, dealers are reporting September totals as equal to August which, in a number of cases, was the high month of the year.

Automatic screw machines, turret lathes, small lathes, grinders and milling machines appear to be in the most steady demand. One turret lathe maker estimates September sales as about 20 per cent ahead of August. While it is now felt that some pending quotations will remain inactive until after the turn of the year, inquiries are good and buying continues in small machines over wide areas. Small tools are in heavy demand.

## *Detroit*

NEW programs are inactive at the present time, as far as the large manufacturers are concerned. There is evidence of buying on the part of smaller shops and one dealer reports the sale of 11 presses to small stamping plants within two days. It is also reliably reported that tool and die shops will invest the profits of their highly successful season in new machinery within the next month or two: the purchase of large and heavy equipment, including precision boring and milling machinery for large body dies, seems to be part of the program. A number of the big body plants are expected to be in the picture.

## *Chicago*

SALES remain light and spotty and inquiries are less active. Nevertheless a large number of propositions are in buyers' hands and the trade feels that improvement may come as the fall advances. The only railroad business in sight is an inquiry for a small lathe by the Santa Fe. Allis-Chalmers Mfg. Co. has not indicated when orders will be released on its building program at Springfield although the plans are in active development. It is thought by some that some old equipment will be spread out in the new building inasmuch as present manufacturing quarters are badly crowded. Small tools remain very active and the September volume promises to exceed the movement in August.

## *Cleveland*

DEALERS report improvement in inquiries for tool room equipment and from buyers in diversified fields. These inquiries are mostly for small single machines. Orders are still light, but with the better volume of inquiry an improvement is expected soon.

Orders are holding up in very satisfactory volume among builders. Turret lathe sales gained 20 per cent in September over August. Forging machinery is not active, but backlogs are heavy.

## *Cincinnati*

MACHINERY inquiries and bookings in this area declined further in the past week. Makers, however, do not appear to be disturbed as the slower demand gives opportunity for overcoming backlogs. Automotive ordering is quiet, tool builders, however, anticipate substantial fall revival. Current leadership is still maintained by grinders and millers, with small lathes in active demand. Manufacturers of boring mills are enjoying a reasonably good demand.

## *Foreign*

ON the basis of machine tools ordered during the past week, greatest interest appears to have centered among foreign buyers. Russia placed substantial orders with the New Britain Machine Co. for a variety of production equipment. Cash payments were involved in these orders. England is said to have placed a number of miscellaneous orders up to two and three machines of a type and to have secured favorable delivery from two sources on a quantity of used machines.

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Wyoming, Penna.
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# PLANT EXPANSION AND EQUIPMENT BUYING

## NORTH ATLANTIC

**Tide Water Oil Co.,** 17 Battery Place, New York, has approved plans for addition to oil refinery at Bayonne, N. J., for new liquefied petroleum gas-manufacturing unit. Cost over $200,000 with equipment.

**Celanese Corp. of America, Inc.,** 180 Madison Avenue, New York, has plans for new power plant at Amcelle rayon mill, near Cumberland, Md., to include installation of 10,000-kw. turbo-generator unit and auxiliary equipment. General building contract has been let to George F. Hazelwood, Cumberland. Cost about $300,000 with equipment.

**Grumman Aircraft Engineering Corp.,** Colkin Street, Farmingdale, L. I., manufacturer of airplanes and parts, has selected tract of about 100 acres at Central Park, Nassau County, L. I., for new plant for parts production and assembling. Cost close to $85,000 with equipment.

**Superintendent of Lighthouses,** St. George, Staten Island, New York, asks bids until Oct. 5 for four automatic gasoline-electric engine-generator plants (Proposal 52208); until Oct. 7 for 400 acetylene cylinders, each 180 cu. ft. capacity (Proposal 52227).

**Washburn Wire Co.,** 536 East 117th Street, New York, manufacturer of steel wire products, has filed plans for alterations and improvements in five-story plant at 537-49 East 118th Street. Cost about $350,000 with equipment. Bart and John P. Walther, 103 East 125th Street, are architects.

**Bureau of Supplies and Accounts,** Navy Department, Washington, asks bids until Oct. 6 for electric cable for Brooklyn, San Diego and Mare Island navy yards (Schedule 8808); until Oct. 13, 21 hand-operated testing generators for Brooklyn and Mare Island yards (Schedule 8887).

**Camden County Board of Freeholders,** Camden, N. J., plans extensions and improvements in county power plant at Lakeland, N. J., including new boilers, stokers, pumps and other equipment. Cost about $276,000. Financing is being arranged through Federal aid.

**Crescent Insulated Wire & Cable Co.,** 319 Olden Avenue, Trenton, N. J., has let general contract to N. A. K. Bugbee & Co., Inc., 206 East Hanover Street, for two-story and basement addition, 60 x 100 ft. Cost over $45,000 with equipment.

**Commanding Officer,** Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until Oct. 12 for fin assemblies for 1100-lb. demolition bombs (Circular 96), metal parts assemblies, assembled for 1100-lb. demolition bombs (Circular 101); until Oct. 12, two steam-generating units, each with rated capacity of 70,000 lb. steam per hr. (Circular 107).

**Standard Brands, Inc.,** 481 South Main Street, Wilkes-Barre, Pa., liquor and food products, has approved plans for one-story addition to factory branch, storage and distributing plant, 60 x 80 ft., with adjoining extension, 30 x 42 ft. Cost over $35,000 with equipment. Main offices are at 595 Madison Avenue, New York.

**E. I. duPont deNemours & Co.,** duPont Building, Wilmington, Del., have let general contract to J. A. Bader & Co., Lackey Building, for one-story foundry at main local shops.

**Commanding Officer,** Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until Oct. 5 for 72 couplings (not bored) (Circular 126); until Oct. 6, 27,000 annealing cartridge brass blanks for electric primer (Circular 118), 2035 lengths annealed steel for shipping bands (Circular 116).

## BUFFALO DISTRICT

**Armour & Co.,** Union Stock Yards, Chicago, will take bids soon for two-story branch plant at Rochester, N. Y. Cost over $50,000 with equipment.

**Bennett Fireplace Corp.,** Norwich, N. Y., manufacturer of fireplace heaters, parts and kindred equipment, has let general contract to Frank L. Banbridge, Norwich, for one-story addition. Cost close to $40,000 with equipment.

**City Council, Buffalo,** plans new hangars, with repair and reconditioning shops at municipal airport. Work will be carried out in conjunction with general expansion and improvements in field, to cost about $1,200,000.

## NEW ENGLAND

**Hampden Brewing Co.,** Willimansett, Mass., has plans for one-story mechanical-bottling works. Cost over $40,000 with machinery. McClintock & Craig, 458 Bridge Street, Springfield, Mass., are architects and engineers.

**Groton Leatherboard Co.,** West Groton, Mass., manufacturer of fiber board products, etc., has work under way on two-story addition, 90 x 200 ft., for which general contract recently was let to Fiske-Carter Construction Co., 8 Norwich Street, Worcester, Mass. Cost close to $90,000 with equipment. H. F. Kimball, 101 Milk Street, Boston, is engineer.

**Commanding Officer,** Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Oct. 6 for one portable potentiometer (Circular 49).

**Crane & Co., Inc.,** Dalton, Mass., manufacturer of paper products, bristol board specialties, etc., has let general contract to D. H. Pike, 30 Eagle Street, for three-story mill addition. Cost over $85,000 with equipment.

## SOUTH CENTRAL

**Monsanto Chemical Co.,** 1700 South Second Street, St. Louis, will begin work this month on new plant at Monsanto, near Columbia, Tenn., where large tract for development as townsite was acquired a few months ago. It will consist of one and multi-story units, primarily for production of sulphuric acid, with machine shop, pumping plant, power substation and other mechanical units. Installation will include three electric furnace units. Company will secure power supply from Tennessee Valley Authority. Entire project will cost close to $2,000,000 with machinery. Charles Belknap is executive vice-president in charge.

**Director of Purchases,** Tennessee Valley Authority, Knoxville, Tenn., asks bids until Oct. 12 for two 80-ton gantry cranes for spillway and intake gates at Pickwick Landing Dam and power house; until Oct. 7, operating machinery for lock gates and segmental valves for locks at Guntersville and Chickamauga Dams.

**Board of City Commissioners,** Mobile, Ala., asks bids until Oct. 5 for mechanical conveyor system in new fruit terminal and cold storage plant in course of construction at Alabama State docks on waterfront.

**Alabama Warehouse Co.,** Troy, Ala., has plans for one-story plant on South Notch Road, where four-acre tract has been acquired for production of superphosphate, used in fertilizer manufacture. Cost about $45,000 with machinery.

## SOUTH ATLANTIC

**American Enka Corp.,** Enka, near Asheville, N. C., manufacturer of viscose rayon products, plans one and multi-story addition, totaling about 100,000 sq. ft. floor space. Extensions and improvements will be made also in power plant, including installation of 3000-kw. turbo-generator unit and accessory equipment. Entire project will cost over $200,000 with equipment. Headquarters are at 271 Church Street, New York.

**B. F. Goodrich Co.,** Arkon, Ohio, has work under way on three-story addition, 135 x 220 ft., to textile division mill at Silvertown, Thomaston, Ga., to be known as Plant C. Cost over $150,000 with equipment. A. T. Matthews is plant manager.

## WASHINGTON DIST.

**Contracting Officer,** Quartermaster Corps, Fort Monroe, Va., asks bids until Oct. 7 for bolts, washers, machine screws, crossarm bolts, flexible conduit, guy wire, switches and other equipment (Circular 2).

**General Purchasing Officer,** Panama Canal, Washington, asks bids until Oct. 5 for steel guy wire, stove, trolley, bare resistance and magnet wire, brass or bronze pipe fittings, water pipe sleeves, bronze unions, flanged unions, motor starting switches, gate and globe valves, soil pipe traps, galvanized steel wire rope snatch blocks, water gages and other equipment (Schedule 3183).

**Bruton Brewing Co.,** 3501 Brehems Lane, Baltimore, has let general contract to William P. Pearson, Inc., 444 Mainfield Avenue, for one-story addition, 105 x 110 ft. Cost over $50,000 with equipment. William C. Clark is company architect.

**National Advisory Committee for Aeronautics,** Langley Field, Va., plans new mechanical wind tunnel, with blower units and other mechanical-draft equipment. Fund of $1,100,000 has been authorized. An addition to seaplane model testing tank will also be built, for which fund of $267,000 is available, including equipment.

**City Council,** City Hall, Salisbury, Md., asks bids until Oct. 5 for one 800-gal.-per-min. motor-driven turbine pumping unit and accessories. Clarke Gardner is city engineer.

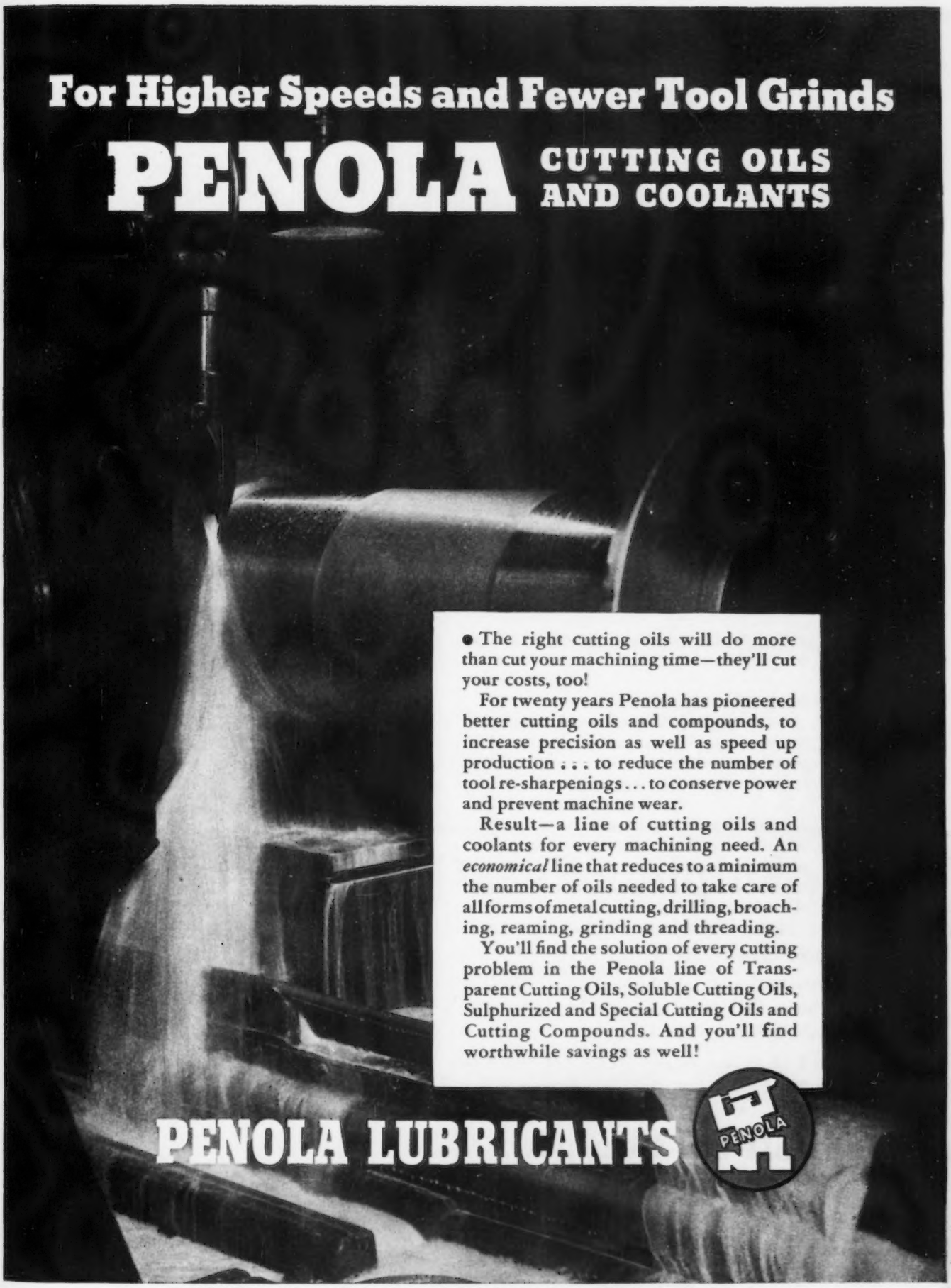
**Bureau of Supplies and Accounts,** Navy Department, Washington, asks bids until Oct. 6 for one motor-driven wood-working machine for Portsmouth, Va., Navy Yard (Schedule 8851), iron pipe fittings for Eastern and Western Navy yards (Schedule 8797).

## WESTERN PA. DIST.

**J. A. Zurn Mfg. Co.,** West Twelfth Street, Erie, Pa., manufacturer of plumbing equipment and supplies, fittings, etc., has plans for one-story addition. Cost close to $40,000 with equipment.

**Domestic Fuel Co.,** Sharon, Pa., plans rebuilding part of tipple at coal-mining plant at Jackson Center, Pa., and power plant, recently destroyed by fire. Loss over $50,000 with equipment.

**Tulip Bottling Co.,** 411 Third Avenue, Johnstown, Pa., plans new two-story mechanical-bottling plant, 25 x 130 ft. Cost close to $40,000 with equipment. H. A. Bailey, Fisher Building, is architect.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## SOUTHWEST

**Beech Aircraft Co.**, Wichita, Kan., manufacturer of airplanes and parts, has secured option to purchase plant of Travel Air Co., including tract of 116,000 sq. ft., which it has been occupying under lease. On acquisition, company plans expansion in buildings and equipment for aircraft production, including parts manufacture and assembling. Walter H. Beech is president.

**Anheuser-Busch, Inc.**, 721 Pestalozzi Street, St. Louis, plans six-story addition to brewery, to be used as a fermenting unit, storage and distribution. Company will also make extensions and improvements in tank department. Cost over $500,000 with equipment.

**City Council**, Coffeyville, Kan., plans extensions and improvements in municipal electric power plant, including new 5000-kw. steam turbo-generating unit and auxiliary equipment. Cost about $200,000 with equipment, of which $90,000 has been secured through Federal grant, remainder to be arranged through municipal financing.

**Hanlon-Buchanan, Inc.**, National Bank Building, Tulsa, Okla., oil operator, plans new gasoline blending plant at Corpus Christi, Tex., where property has been acquired near city limits. It will include high-pressure steel tanks, pumping machinery and other mechanical divisions. Cost close to $100,000 with equipment. It is proposed to build a second unit early in 1937, costing close to same amount.

## MICHIGAN DISTRICT

**Kelvinator Corp.**, 14250 Plymouth Street, Detroit, manufacturer of electric refrigerators and parts, air-conditioning equipment, etc., has let general contract to O. W. Burke Co., Fisher Building, for two additions, one-story, 440 x 560 ft., and two stories, 80 x 360 ft., for expansion in manufacturing divisions. Cost about $600,000 with equipment. Albert Kahn, Inc., New Center Building, is architect and engineer.

**City Council**, Gladstone, Mich., plans new municipal electric power plant and distributing lines. Cost about $100,000 with equipment. Bond issue in that amount will be placed before voters for ratification at general election, Nov. 3. Shoecraft, Drury & McNamee, Ann Arbor, Mich., are consulting engineers.

**Barkley-Grow Aircraft Corp.**, French Road, Detroit, recently organized with capital of $750,000 by Harold B. Grow, 2017 Penobscot Building, and associates to manufacture all-metal light type airplanes, light steel propellers and kindred aircraft equipment, has taken over Supreme Propeller Co., Wichita, Kan., and will remove works to new plant at Detroit.

**Muskegon Motor Specialties Co.**, Muskegon, Mich., manufacturer of crankshafts, camshafts and kindred automotive products, has asked bids on revised plans for one-story addition. Cost over $40,000 with equipment.

## OHIO AND INDIANA

**Lees-Bradner Co.**, 6210 Carnegie Avenue, Cleveland, manufacturer of gear-cutting machinery, tools, etc., will take bids soon for one and two-story plant unit at East 131st Street and Taft Avenue. Cost over $50,000 with equipment.

**General Tire & Rubber Co.**, Akron, Ohio, has purchased former one-story plant of Service Motor Truck Co., Wabash, Ind., about 240,000 sq. ft. floor space, and will remodel for branch mill, primarily for production of mechanical rubber goods. Facilities will be provided for employment of about 500 persons. Cost over $100,000 with machinery.

**Sorg Paper Co.**, Middletown, Ohio, manufacturer of paper products, plans new two-story and basement mill, 115 x 130 ft., on Grand Avenue, with one-story storage and distributing building, 50 x 150 ft. Extensions and improvements will be made in power plant, including additional equipment. Cost over $150,000 with machinery.

**Contracting Officer**, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until Oct. 5 for galvanized pipe, wrought iron pipe, bronze valves, angle valves, globe valves, machine bolts, steam traps, etc. (Circular 184); until Oct. 8, one combination shear, punch and coper machine, one triple gage attachment and one motor-driven hammer (Circular 206).

**Hughes-Curry Packing Co.**, 2000 West Eighth Street, Anderson, Ind., meat packer, has asked bids on general contract for two additions, one-story, 70 x 150 ft., and three stories, 40 x 70 ft. Cost over $70,000 with equipment. Smith, Brubaker & Egan, 30 North LaSalle Street, Chicago, are consulting engineers.

## MIDDLE WEST

**Midwest Stamping & Enameling Co.**, Morrison, Ill., manufacturer of enameled iron products, refrigerator cabinets, etc., plans one-story plant at Galesburg, Ill. Cost close to $50,000 with equipment.

**D. O. James Mfg. Co.**, 1114 West Monroe Street, Chicago, manufacturer of cut gears and kindred products, has let general contract to Magnussen & Wold, 4322 West Drummond Place, for three-story addition, 35 x 120 ft. Cost over $50,000 with equipment. Carl Hauber, 25 East Jackson Boulevard, is architect.

**Fleischmann Malting Co.**, 327 South LaSalle Street, Chicago, a unit of Standard Brands, Inc., New York, has asked bids on general contract for extensions and improvements in branch plant at Red Wing, Minn. Cost about $45,000 with equipment.

**Board of Education**, Redwood Falls, Minn., plans manual training department in new two-story and basement high school, to replace structure recently destroyed by fire. Cost about $250,000. Financing has been arranged through Federal aid. Pass & Rockey, Ekle Building, Mankato, Minn., are architects; Rose & Harris, Essex Building, Minneapolis, Minn., are mechanical engineers.

**Northern Pacific Railroad Co.**, St. Paul, Minn., has let general contract to Lovering & Longbotham, Builders' Exchange Building, for addition to engine house and locomotive shops at Livingston, Mont. Cost over $50,000 with equipment. Bernard Blum is chief engineer.

**Chain Belt Co.**, 1600 West Bruce Street, Milwaukee, is considering plans for extension of foundry and machine shop center at South Forty-fifth Street and West Greenfield Avenue, West Milwaukee, by two-story addition, 100 x 500 ft. Details are not yet available.

**Seaman Body Corp.**, 3880 North Richards Street, Milwaukee, subsidiary of Nash Motors Co., Kenosha, Wis., has placed contract with Permanent Construction Co., 2712 North Holton Street, for new unloading house and craneway, 57 x 200 ft., one-story. Fred Hanschman is company engineer.

**Marinette, Wis., Board of Vocational Education**, H. E. Munson, president, has received approval of PWA grant of $51,136 toward construction of new $114,000 vocational institute, 132 x 207 ft., two stories and basement, designed by Derrick Hubert, architect, 1065 Sheridan Road, Menominee, Mich. Bids will be taken soon.

**Weber & Son Paper Converting Machine Co.**, Kiel, Wis., has been organized by Herman G. Weber and son, Herbert, Sheboygan, Wis., to lease plant of Kiel Machine Co., affording 8000 sq. ft. floor space, for production of machinery for paper bag mills, heretofore built under contract with Sheboygan machine shops. Some new equipment will be purchased.

Officers and former employees of the **Great Lakes Malleable Co.**, 1831 South First Street, Milwaukee, which has been idle for more than three years, have incorporated the Great Lakes Foundries Co-operative, Inc., with an authorized capitalization of $65,000, to resume operations. The step has been taken, according to John W. Sanders, president of the new firm and an executive of the old organization, because active foundry capacity in Milwaukee at present is not sufficient to handle all of the business available. Other officers, besides President Sanders, are Herman Fleishour, vice-president and general superintendent, and Edward J. Tarkowski. The new firm is investing about $25,000 in rehabilitating the Great Lakes plant.

## PACIFIC COAST

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Oct. 13 for one motor-driven pipe and bolt threading and cutting machine (Schedule 8864), four complete windlasses and four sets spare parts (Schedule 8865) for San Pedro, Los Angeles, Naval Station; 87 steel target carriers (Schedule 8856) for San Diego Naval Station.

**Golden Age Brewery**, Spokane, Wash., will asks bids soon on general contract for one-story addition. Cost over $40,000 with equipment. Rigg & Vantyne, Peyton Building, are architects.

**Boeing Aircraft Co.**, West Hudson Street, Seattle, has let general contract to Austin Co., Dexter-Horton Building, for one-story hammer shop, 90 x 120 ft., adjoining new assembling plant, now in course of erection. Installation will include seven drop hammers, modeling, die-casting and other equipment. Cost over $75,000 with equipment.


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